IN THE CIRCUIT COURT OF JEFFERSON COUNTY

STATE OF MISSISSIPPI

EZELL THOMAS, ET AL. AND OWENS CORNING, Plaintiffs,	
vs.	Civil Action No. 96-0065
R. J. REYNOLDS TOBACCO COMPANY, et al., Defendants.	[redacted]

March 28, 2001
Richmond, Virginia

The videotaped deposition of **RICHARD A. CARCHMAN, Ph.D.**, taken at the instance of the Plaintiffs, before Carolyn M. O'Connor, RMR, CRR, a Notary Public for the Commonwealth of Virginia at Large, beginning at 9:00 a.m., at Hunton & Williams, Riverfront Plaza, East Tower, 951 East Byrd Street, Richmond, Virginia; said deposition taken pursuant to the Rules of the Mississippi Rules of Civil Procedure.

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RICHARD A. CARCHMAN, Ph.D., called by the Plaintiffs, first being duly sworn, testified as follows:

EXAMINATION BY MR. FORMAN:

Q Dr. Carchman, my name is Rick Forman. I think we met a few minutes ago. I know you've given a deposition in tobacco cases several times before. If there's anything that I ask you about that you don't understand, please feel free to ask me to rephrase it, and I'll be glad to do that.

A Thank you.

Q What is your current affiliation with Philip Morris?

A I am a consultant.

Q And you are not employed full time; is that correct?

A That's correct.

Q Is there still a number of hours that you're limited to working per year?

A It's days, and my contract now reads 205 days.

Q Per calendar year?

A Yes.

Q When is the last time you've given any

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testimony in a tobacco case?

A Felise, I believe.

Q No deposition since then?

A No.

Q Do you have any other depositions scheduled in the near future?

A I have finishing up Scott, and I think that is in two weeks, a little over two weeks. We did Scott last year, and they wanted some additional time, so they're getting three or four more hours.

(Carchman Exhibit 1 is marked.)

MR. COFER: For the record, let me note that the deposition, as always -- I'm sorry, has also been cross-noticed in the Fibreboard case.

MR. FORMAN: I understand that a motion to quash has been filed in the Fibreboard case in California, and I assume they're going to take care of that out there. I'm just aware that there has been a motion to quash. I don't think it's been resolved, but I guess that's just for a later date obviously.

Q Have you seen the notice before,

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Dr. Carchman?

A No, I haven't. Looking at this page, I've not seen this.

Q Would you look at the letter I believe that's attached to the notice from Bruce Tepikian. I'll ask you if you've looked at that.

A This I saw yesterday.

Q Is that the first time you've seen the letter?

A Yes.

Q Is there anything in there that is listed as areas of your testimony that is incorrect?

A No.

Q Dr. Carchman, what action taken by Philip Morris in the smoking and health area do you most regret?

A Could you repeat the question.

Q What action taken by Philip Morris in the smoking and health area do you most regret?

MR. COFER: Object to the form of the question.

A As I sit here this morning, I feel that if the company had done some of the actions it's taking now a little bit sooner, it would have been -- it would have been better for the company in terms of

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the website and those things that revolve around that.

Q Can you be more specific?

A Sure. The fact that we have now basically taken the position that the public health message will be the only message that the public will hear; that the website basically lists places for people that smoke or are considering smoking to go to, and if they don't have a computer, I think there's a 1-800 number; and the fact that we are continuing to engage scientific and public health individuals and organizations, whether they're government or non-government, to work with us in terms of trying to develop less hazardous products.

Q Do you believe the company should have acknowledged at least by 1964 that smoking causes lung cancer?

A To the extent that the 1964 Surgeon General's report arrived at the judgment that smoking was causally related to lung cancer in men based on the epidemiology, and not until '65, the following year, did it arrive at the same position in women, my feeling is, based on the considerations -- based on the considerations that now appear in the website, with 20/20 hindsight, if you will, or Monday-morning

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quarterbacking, though, the issues we have --

(Off the record; videographer sets up at this time; Carchman Exhibit 2 is marked.)

MR. COFER: For the record, we marked as Carchman 2 the amended cross-notice in the Fibreboard case.

Q Dr. Carchman, we're now on video. We were a little late or had a mixup with the video people and getting them here on time. Just for the record, would you introduce yourself for the video.

A My name is Richard Carchman.

Q We were starting your response to a question I had asked about prior positions taken by the company, and I think the question initially asked you was whether there was anything -- or what you most regret about positions taken by Philip Morris in the smoking and health controversy. And perhaps you can go ahead now and answer that question fully.

MR. COFER: I object to the form of the question.

A As I said earlier, as I sit here this morning reflecting on this, it's probably that the position we have now, as stated on our website, is

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one that I feel should probably have happened a lot sooner than it did.

Q When you say "a lot sooner than it did," would you agree that it should have been done in 1964?

A I think it could have been done earlier. Specifically what date it could have been done from, I really haven't -- I haven't thought about other than to say it should have been done a lot earlier than it was done. If you just use the U. S. Surgeon General as a measure of identification of things, as I said earlier, the '64 only identified smoking and lung cancer in men, '65 in women, and then you don't get to things like COPD until the next decade.

But nevertheless, the point I'm trying to make is that the position we have now is the right position. In retrospect, 20/20 hindsight, Monday-morning quarterbacking, at least for me, it would have been better for the company to have taken this position sooner. Specifically when, I can't tell you, but sooner, yes.

Q Let's talk about what that position is, so we're clear on the record as to what the current position of the company is with respect to smoking as a cause of lung cancer.

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A The company's position is that smoking is a cause of lung cancer.

Q Now, could you state whether in your opinion that position should have been taken at least by the decade of the 1960's.

A If one focuses on the assumptions and conditions that the Surgeon General used in arriving at that conclusion based on epidemiology, you could have taken it at that point. I think for Philip Morris the aspects of that that they focused on for a number of years were scientific issues, things that were not known or not understood, and so there was -- and again, this is me reflecting back.

There was more of an emphasis on Philip Morris' part with regard to what wasn't known; whereas, the Surgeon General and other public health authorities said, "This is what's known, and that's enough for us. We don't need to know what the constituents are. We don't need to know the mechanisms. We have the epidemiology and that's enough. The position the company took was that from a purely scientific basis, the epidemiology was important, but it wasn't sufficient.

And the situation now, though the scientific questions remain unanswered and the

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answers to those questions are very important for the company's ability to try to come up with safer products, the company has said, "Let's not argue about this. Our arguing has gotten in the way of our ability to work with the people we need to work with to develop -- try to develop safer products. So let's move away from that. We marginalized ourselves by making this position. Let's move beyond this." And that, I think -- at least from my perspective and the people I work with in R&D, that's a good thing.

Q Would you agree that by 1964, insofar as the public health community was concerned, there was an overwhelming consensus that smoking was a cause of lung cancer?

A As I've said before, using the Surgeon General's report in '64, for men their position was that smoking caused lung cancer. Was it overwhelming? I'm not sure exactly what overwhelming means. If I look -- reflect on their chapter on causation, it's clear that, one, they made it -- made a statement that you can't use statistics to prove cause, and they listed a number of points that would have to be satisfied to allow them to make the statements about cause.

At the end of the day, they concluded it

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was a judgment call. So to the extent that the Surgeon General in '64 said these kinds of things and said it was a judgment call, I would say to use the word "overwhelming" is probably not appropriate in '64.

Q Do you recall having ever testified in the past that you thought that the evidence was, quote, pretty darn close to overwhelming in 1964?

A For men?

Q Yes.

A For men.

Q Yes.

A Yes.

Q The report that was submitted to us in this case as your report I believe is dated in July of the year 2000. Do you happen to have a copy of that with you?

A Yes.

Q Has this report been used in any other cases?

MR. COFER: Do you mean has this specific report?

MR. FORMAN: Yes.

Q In other words, is this a report that's been submitted in other tobacco cases?

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A I'd have to look through this, sir. If it has information on asbestos, then the only other case that I can think of that either this or parts of this might have found their way to would have been the Felise case, but I would have to -- but this is very similar to the kind of expert report that I've used in the past and that has been submitted for other cases in the past. Whether this specific one precisely has been submitted in other cases, I just -- I can't answer that at this moment.

Q In the past year, have you submitted any publications or any manuscripts or articles for publication in the scientific literature on smoking and health?

A Yes.

Q What have you published?

A Whatever I've done I've given to Dyanna, Ms. Nyc, to be included on my *curriculum vitae* and to add to my reliance documents. Having said that, I have a -- there's a presentation being made at the International Toxicology Meeting in Brisbane, Australia, and there is an abstract for that that has been accepted of which I am a coauthor regarding the Philip Morris Total Exposure Study design.

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Q Can you give me some more detail about what that's about.

A Oh, of course, of course. Philip Morris has initiated a program to evaluate exposure of smoke constituents, both gas phase and particulate phase, in smokers in the United States using state-of-the-art analytical, chemical, biochemical and molecular biology procedures with an outside contracting organization. This protocol was presented last -- last year to the Institute of Medicine as part of their hearings at the request of the U.S. Food and Drug Administration to look at the issue of tobacco and developing less hazardous products. And that's on their website. It's publicly available.

It also was presented to Dr. Greg Connolly, who's the head of the Department of Health in Massachusetts. It was presented to the World Health Organization in Geneva, Switzerland. It hopefully will be the most comprehensive and therefore largest study of its kind ever mounted by anyone, whether it's a company or a government, to actually try to measure how much of the things that are in smoke people who smoke are exposed to.

And this has at least multiple purposes.

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Am I answering?

Q Yes.

A One purpose is that there has only been either indirect, that is, through asking people through questionnaires, or through small sampling, looking at single components of smokers, to try to get at how much people are actually exposed to. So that's one point of great importance.

There will be a questionnaire, an extensive questionnaire, to the individuals as well as sampling of breath and biological fluids; and some of the biological material will be banked, that is, put into a storage facility, for some later time for either us or somebody else as technology and science continues to advance and people come up with new and better approaches to understanding how to measure exposure, that we would have these samples to then either analyze or have somebody else analyze.

The other part of this has to do with trying to develop reduced-harm products. So if you knew what people were actually exposed to for the different kinds of cigarettes that they smoke and for the different kinds of people, so we're trying to do a study that has a demographic depth and breadth that would cover the U. S. population as -- whether it's

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men, women, minorities, whatever, and follow these people with time, such that when we have a notion or somebody else has an idea about how to modify the product to reduce exposure and therefore potentially reduce risk, we have a way of scientifically and objectively measuring this.

So this particular presentation will be the first time that this whole design will be presented to the open scientific community. It's been presented to government and nongovernmental organizations. Individual outside scientists have seen parts of this. So, for example, Dr. Neal Bonowitz has seen parts of the questionnaire, I've talked to him about this. And we're also in the process of setting up an external group of scientists, external to Philip Morris, to help us as we move forward in this to make sure that we are doing all the things that are scientifically possible to do to answer all of the important questions that people have had that the technology is now starting to come online for us to do. This will be done following good laboratory practices, and in this case the information will be available to people from the outside to review, and our expectation is this will result in a variety of publications and

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presentations. But all of this is outlined in a lot more detail in the Institute of Medicine website, because we turned over all the material that we were going to do.

I think I've captured the essence. There's a lot more to it, but that's really the essence of it.

Q. Is there anything else you have submitted for publication?

MR. COFER: What's the timeframe?

MR. FORMAN: In the last year.

A. There might have -- there might have been or there might be now. There's stuff I've been working on. I'm not sure it's been submitted yet. It might have been submitted.

Q. What area are you working on on smoking and health?

A. There is a project that I've been involved in for a number of years. It's a lifetime tobacco smoke exposure study. Some of it's been published. We've just had an independent pathology group look at our pathological slides to see if they come up with the same conclusions we've come up with. They don't know what our conclusions are. They're looking at these slides blinded.

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The second is --

Q Let me stop you for one second on that, on the pathology slides. Have you identified a series of changes in cells leading to cancer, for example?

A Yeah, that's a good question. The answer is we have seen the standard changes that we and others have reported related to irritative changes, but in the 24 months of exposure and six months post exposure in these rats, so it's a 30-month study, in both males and females we did not see any increase in lung cancer, no dose-related effect.

We had included in that study diesel engine exhaust as, if you will, a positive control, at the same levels that we did the tobacco smoke exposure, and in the diesel engine exhaust, as others have shown in Europe and Asia and the United States, you get a very nice dose-response lung tumor.

I would say an important aspect of what we did here, unlike what 99 percent of other people have done -- when people have done a tobacco smoke exposure -- now I'm including everyone prior to this -- when they look at the lungs, they take one slice through the lungs, and generally speaking, no one has been able to, except in one very special animal model, the A/J Mouse that Dr. Witsci has been

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working on, been able to demonstrate a dose-related lung tumor response to tobacco smoke.

What we've done here is we've taken a step serial section through the lungs. So we've taken 15 sections every 500th microns, and when you do that you increase the dynamic range, the sensitivity of the assay, by a factor of five to ten, okay?

Having said that, we didn't see anything with the tobacco smoke. There's a group in New Mexico, the Loveless Inhalation Facility, that's been studying tobacco smoke for a long time, and I believe the toxicology meeting is this week. We are approaching them to see if they still have their tissue blocks from their studies to ask them if they would consider doing the 15 cuts through the tissue block. We pay for it. They can do it, we'll do it; we don't care. We think that when they do that, that they will be able -- we think. We don't know. We think they'll be able to demonstrate a significant increase in lung tumors in their rat model.

Heretofore, they could only get a statistically significant increase in females, not in males. I think the maximum response is about eight percent. If we're right, that eight percent could become 30 percent. With 30 percent you now have a

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dynamic range where you could have an animal model and then be able to try to address some of the questions, what is it in smoke that's doing it and how does it -- how does it work? So that approach has been taken, and we're trying to do this with a number of other people we believe have similar types of tissue blocks but haven't looked at it the way we've started looking at ours.

Q Before -- I know you said there was another project. Before you go to that --

A Yes.

Q -- have you attempted to do this same type of analysis on any human lung tissue?

A I don't know if -- I mean, you could do multiple step serial sectioning, but I'm not sure I understand the point. Yes, you could do it. No, we haven't done it. I don't understand the point of your question, but that's -- we haven't done it.

Q With regard to the prior project you mentioned with the Institute of Medicine, have there been any what you would describe as breakthroughs and new knowledge gained?

A Well, it's too early to tell. The project has just started. I would anticipate -- we have a pilot study going online this spring. It's a hundred

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and something, 130, 150 human subjects, where we're going to be validating -- and I use that in its scientific sense, validating some of the assays we want to look at. Nobody has ever done that. So this is an analytical validation. We have a menu of things we want to measure that we and others believe could be important. Nobody really knows. And before you can actually do it, you have to make sure that the methods are robust enough that when you do the study and you get data, that you can do something with the data and that you have a sufficient size, group size, that it could mean something.

My expectation is that this menu will become -- will change. Some things will go away, some things will come on. Some of the analytical methodologies just will not be adequate for what we want. We'll have to either drop them and/or find other things.

And that pilot study is a six-week study, so if we start it in June, the study itself will be done what, sometime, July, August. It will probably take several months to do the analyses, and then several more months to take that data and put it together.

And I know there's a presentation,

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publication plan for this, that this is going to -- as soon as it's put together, it's going to go out. I believe it will be not just sent to the scientific community for review and comment, but also sent to some of the folks that were on the IOM, for example, and probably to Dr. Connolly in Massachusetts.

Q You mentioned a second project, I believe, that you are currently involved in.

A Yes. This is an evaluation of Philip Morris commercial brands under the Federal Trade Commission and exaggerated smoking conditions. The exaggerated smoking condition we chose is the one that Dr. Connolly uses in the Commonwealth of Massachusetts, where you basically change the puff volume, the blockage of the vent holes to some degree, and so you exaggerate what the smoke constituent delivery would be.

So that study is pretty much done, and it's looking at, oh, maybe nine Philip Morris brands from Merit Ultima to Marlboro Red. It includes a charcoal product, a menthol product. It includes three reference cigarettes - two U.S. reference cigarettes, the Kentucky 1R4F, the Kentucky 1R5F; the Canadian reference cigarette - and our electrically

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heated cigarette.

And so in addition to normal and exaggerated smoking conditions, there are three things we're doing. One is smoke chemistry. So we're looking at 50 or 60 individual smoke constituents that have been identified by the public health community under these conditions. We're doing Ames assays under those two conditions, and we're doing a mammalian cell cytotoxicity.

And my expectation is that there will be a presentation of the data this fall, and the manuscript for the study will be submitted to a peer review journal this fall.

Q What is the ultimate purpose of that? What are you trying to -- where are you trying to get to?

A Yeah, this has been an area of interest scientifically for two reasons. One has to do with some observations that were published in 1975 by a Japanese group doing Ames assays, SATO, S-A-T-O, et al., doing Ames assays on U.S. cigarettes, European cigarettes and Japanese cigarettes. And they were asking the question -- a question: Are there any differences in the commercial marketplace in the three -- those three parts of the world, and the

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answer was no, that the cigarettes all behave -- that the tar was the tar.

And then there were two subsequent publications by R. J. Reynolds scientists, one in '94, Steele, et al. I think that was in -- it was in mutation research, and a more recent publication, maybe 2000, the year 2000, by Chebinga, et al. in food and chemical toxicology, where they looked at 80 or 90 percent of the commercial U. S. marketplace. And they did in the Steele Paper Ames activity, and they had the 1R4F reference cigarette, which is about a 10-milligram FTC tar-delivery product; and what they showed was that the commercial marketplace in the United States, as a function of tar, that it didn't matter whether you were using a low-tar cigarette or a high-tar cigarette or the reference cigarette, that tar is tar.

If you did this on a per-cigarette basis, then you saw a very nice linear relationship between tar delivery and Ames activity. I mean, it's not -- it's what you would have expected in terms of the commercial marketplace. The 1R4F is a non-flavored cigarette, and it just fell right on the line, the prediction line.

Their second publication, they looked at

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smoke chemistry and they did Ames activity. It was an update, if you will, and a slight extension. What we have done is added another assay. The Ames assay is a bacterial mutagenesic assay, so we've added a mammalian cell assay, and we've done this under two different smoking conditions.

The Reynolds work was done under Federal Trade Commission smoking conditions, and we did it under FTC and we did it under this exaggerated smoking condition, and we looked at a number of different reference cigarettes.

In the second Reynolds publication, they also included there 1R5F, which is about a two to three milligram and that also fell on the line with the commercial marketplace. And the 1R5F, like the 1R4F, has no flavors in it.

And the data that I've seen so far -- so this has not been peer reviewed by the outside. It's not been published -- basically supports the work of SATO in '75 in Ames activity, is consistent with what Reynolds has done, and we've now extended it beyond there. And the differences that you see are readily explainable by things that we and others understand.

So if you were to put the Canadian reference cigarette, it doesn't fall on the U. S.

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line. It's different than commercial products in the U. S. From a chemistry and biology perspective, it's different than the Kentucky reference cigarette. Unlike American blended cigarettes, the Canadian cigarette is all Virginia -- all Virginia tobacco, and its properties are predictable based upon what's been known for 20-something years; and so that was sort of a control -- you know, if this is a robust sensitive enough test, you should be able to pick up differences, and there were differences.

The electrically heated Accord cigarette, we already knew from other work we had done and presented how that was going to -- how that was going to behave, and so that was just what I would call an important aspect of scientific investigation, and that's to replicate stuff.

So now to your question, okay, why is this important. We have used and continue to use the reference cigarette for addressing some questions, okay? And this is a test that was going to tell us whether the use of the reference cigarette for the questions we're asking remain appropriate, okay?

So far, for these questions I would say we remain comfortable with the use of these reference cigarettes, but let me add the following point: In

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our presentation to the Institute of Medicine, which we've made this particular point, if we came up with a modified product that we felt was harm reduced and we did exposure studies, we did Ames and cytotoxicity and animal inhalation studies, that would not be compared to a Kentucky reference cigarette. We would take that product as it would be commercialized and evaluate it, because that question, harm reduction, is a different question than the question we were addressing with the reference cigarette. So it is to me a very important technical aspect of this whole testing paradigm that we've been using, and the one that we're moving into.

MR. COFER: If you're at a good point, can we take about a five-minute break?

MR. FORMAN: All right.

(Break taken.)

Q Dr. Carchman, are you aware of any action taken by Philip Morris in the 1980's to discontinue humectant purchases from Merrill Dow because of their attack on cigarette smoking through the use of Nicorette Gum?

MR. COFER: Object to the form of the

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question.

A I didn't get to the company until approximately 1989, so I wouldn't know anything about that.

Q So is it your testimony that you don't know anything about what the company did before 1989?

MR. COFER: Object to the form of the question.

A No, I didn't say that. With regard to your particular question about purchasing materials, that wouldn't be my area even when I was with the company.

Q In 1984, given the health consequences of smoking, do you think it would be appropriate for persons to use Nicorette Gum or other nicotine substitutes or nicotine products like that for the purpose of attempting to quit smoking?

A If those individuals, in conjunction with their physicians and with guidance from their physicians, felt that was the appropriate thing to do, yes.

Q Do you think it would be appropriate for a tobacco company to cease doing business with a company if it sold a product like that?

A I have no idea. I have never even thought

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about that.

Q Do you know whether Philip Morris ever took any position with respect to opposing discounts provided by the insurance industry for nonsmokers?

A I have no knowledge.

Q You have no knowledge of that?

A No knowledge of that.

Q Never heard of it?

A No.

Q Would that be appropriate in your estimation?

MR. COFER: Object to the form of the question.

A I mean, is there some context for that?

Q Do you think it would be appropriate for insurance companies to grant discounts to policyholders, for example, in life insurance policies, to nonsmokers?

A I have no idea other than to tell you when I have applied for insurance and the question of smoking came up, and because of the hazards associated with smoking, if you were to list yourself as a smoker, you paid a higher premium. I'm not an actuarial, I'm not an insurance person; but from a business perspective, though I'm not a businessman, I

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would say it would -- at least superficially to me, it makes -- it would appear to make some sense.

Q Would it be appropriate for a tobacco company to oppose those kinds of discounts on the grounds that it might hurt their volume of cigarette sales?

A I haven't given -- I haven't considered that question, but I guess my answer would depend upon the nature of what you would call opposition. Like I said, I don't know anything about that; but if you'd give me some material to look at, that might help.

Q Have you reviewed in the past the interview by Joseph Cullman on Face the Nation in January of 1971?

A I have looked at parts of that in the past.

Q Do you recall his statement that "We do not believe that cigarettes are hazardous. We do not accept that"?

A I recall statements. Whether it specifically says that in that interview -- if you're telling me he said that in that interview, I believe -- I'll take your word for it.

Q In 1971 would that have been an

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appropriate position to take in a televised interview to the nation in your regard by a tobacco executive?

A I'm a scientist and, for better or worse, I look at things as I've been trained, and I can tell you as a scientist, it is an incorrect statement to talk about something being -- not being harmful. It is a scientifically unprovable provable proposition. Whether it was -- if that's indeed what he said, then it's technically incorrect. Whether he appreciated that or not, I don't know.

Q How many epidemiologists had Philip Morris employed by 1964 to your knowledge?

A By 1964? I don't know.

Q By 1971.

A I've never looked at it from that perspective.

Q When is the first time you're aware of the company having employed an epidemiologist?

A And when you say "employed," that could be under contract or --

Q Direct employment.

A As an employee?

Q Yes.

A I'm only aware of one person, Dr. Betty Nelson, who is currently employed with the company,

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who is trained as a statistician epidemiologist.

Q And when was she employed?

A She's still employed. She started a year or two ago.

Q 1999?

A Could be. I think that sounds about right.

Q And to your knowledge that's the only person that's ever been in the direct employ of Philip Morris as an epidemiologist?

A Not counting consultants, I think that's -- to my knowledge, I think that's correct.

Q Are you familiar with the recent submission by Ellen Merlo to the Tobacco Commission dated February 14, 2001, regarding the company's comments on the President's Commission on Improving Economic Opportunity in Communities Dependent on Tobacco Production while Protecting Public Health?

A I have no idea what the Tobacco Commission is. I know who Ellen Merlo is.

Q Who is Ellen Merlo for the record?

A She's a senior vice-president in Philip Morris USA Corporate Affairs.

Q I'm going to hand you that.

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(Carchman Exhibit 3 is marked.)

MR. COFER: Is there a specific question?

MR. FORMAN: Yes.

Q If you can open it up, I think you will see -- I can find it for you if you need to scan it for a minute, but she talks about Philip Morris supporting the consistent public message on the role played by cigarette smoking in the development of disease, smoking and addiction. We talked about that a little already. Then if you go down, it says "Moreover, it is a fact that government agencies have concluded." Do you see that part?

A Yes.

Q Would you take a look at that and let me ask you a question about that.

MR. COFER: You want him to read that paragraph?

MR. FORMAN: Yes.

A (Complying.) Yes, this is --

MR. COFER: Wait, there's no question.

Q The first part that I started to ask you about or read part of indicated that Philip Morris supports the consistent public message on the role played by cigarette smoking.

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MR. COFER: Of the development of disease in smokers and smoking and addiction.

MR. FORMAN: Correct.

Q Then down in this paragraph, it says "Moreover, it is a fact that government agencies have concluded."

MR. COFER: "That secondhand smoke causes disease."

MR. FORMAN: Yes.

Q And that's what I want to get to. Does Philip Morris agree with the conclusion of the government agencies that secondhand smoke causes diseases including lung cancer and heart disease in nonsmokers?

A I don't know exactly how to answer that question. In the latest annual report on Page 24, there's a statement that appeared to me -- and I have it on my calendar to speak to some of the scientists in R&D about it. It appears to me that there seems to be some degree of concurrence, but I'm not actually -- actually sure about that.

The second part, asthma, respiratory disease in children, this I know I'm sure of. This is definitely standard, has been standard policy with the company. The first part, I'm interested in

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knowing the answer to that as well.

Q What is your position with respect to secondhand smoke is a cause of lung cancer in nonsmokers?

A From my own scientific perspective, I don't believe that the data is compelling.

Q So you do not believe it has been established as a cause of lung cancer?

A Not scientifically, no.

Q Or epidemiologically, do you believe --

A No.

Q Either way.

A That's right.

Q Is your position, then, contrary to the position of what Ms. Merlo described as the government agencies'?

A I'm not sure.

Q Well, if she says "Government agencies have concluded that secondhand smoke causes disease - including lung cancer and heart disease" --

A No, she says, "It is a fact," and I'm well aware of which agencies have concluded what and why. That's a fact. What I'm saying is that an evaluation of data and the underlying assumptions provide no compelling argument that indeed that fact is true or

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those facts are true.

Q What government agencies have concluded that secondhand smoke causes lung cancer?

A The Environmental Protection Agency, and we're not limiting ourselves to the U. S., or are we?

Q No.

A The International Agency for Research on Cancer, the Scoth Committee, the UK Government Health Authorities have concluded that, the Australian Medical Health and Research Council has concluded that, the American Cancer Society has concluded that. There are others.

Q Are you aware of government agencies in the United States which have made a contrary conclusion of record?

A Government agencies -- there have been government bodies directed by government agencies that have raised questions about the scientific basis for those conclusions, and those are publicly available -- publicly available documents. Scientific organizations that respond to Congress, the Congressional Research Office, has done some reasonably good work, I think, in terms of evaluating -- evaluating this.

Q Has any government agency to your

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knowledge issued an official publication in which they have concluded that secondhand smoke does not cause lung cancer and heart disease?

A As an overall conclusion?

Q Yes.

A Not that I'm aware of.

Q Are you aware of any government agency outside the United States which has made that conclusion?

A Government agency?

Q Yes.

A Not that I'm aware of.

Q She also indicates further in the document that Philip Morris believes "the best approach is for the FDA, and not a tobacco company, to decide what is in fact reduced risk."

A Where are you?

Q I think it's farther over in the document.

MR. COFER: Take a minute, Richard, and read that.

A Page four of five, "Encouraging the Development of Responsible Marketing of Reduced Risk," is that where --

Q I guess -- let me just -- maybe this will shorten it: Do you agree that the best approach is

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for the FDA, and not a tobacco company, to decide what is in fact reduced risk --
A Absolutely.
Q -- and what communications are appropriate on the subject?
A Absolutely.
Q Do you know of any tobacco company which has taken a contrary position?
A No, I have no knowledge one way or another.
Q Now, you earlier testified, I believe in the Felise case, about some statements by former chairman Mr. Bible, and I believe you were asked whether you agreed that when Philip Morris issues a press release or makes a public statement, they intend for them to be accurate.
A I'm sure I said that.
Q And you would agree with that?
A Yes.
Q Are you aware of any statement by Mr. Bible that if one person died from using Philip Morris products, he would shut the business down?
A I may have. Doesn't do -- doesn't resonate with me, no.
Q Would that surprise you, that he would

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have made such a statement?

MR. COFER: Objection. If you have such a statement, I'd ask that you show it to the witness.

Q All right, I have Page 5710 of the testimony of Mr. Bible in the Minnesota trial, and I'll ask you to take a look at this and to see if this refreshes your memory as to whether you have ever heard of or been told that he made such a statement, that is, if one person died as a result of your products, he would shut the business down.

MR. COFER: And for the record, this is one page from Mr. Bible's testimony in a trial taken out of context from his testimony; is that correct?

MR. FORMAN: It's one page of the testimony from the trial. I don't know that I would agree that it's taken out of context.

MR. COFER: Okay.

There's no question pending. Just read it.

Q The question that I asked you, Dr. Carchman, is whether you are aware of that statement having been made by Mr. Bible.

MR. COFER: Other than him reading the

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testimony that you've just handed him?

MR. FORMAN: Correct.

A In looking at this Page 5710?

MR. COFER: The question is, are you aware of this statement being made other than it being shown to you now at the deposition.

A I may have seen this before. I don't really know.

Q Are you aware of any intent by Philip Morris to shut the tobacco business down at this time?

MR. COFER: Object to the form of the question.

A I have no knowledge one way or another.

Q Are you aware at this time of any statement by Philip Morris or any corporate official of Philip Morris, whereby they have officially retracted any pledge made in the Frank Statement of 1954?

A Retracted?

Q Yes.

A I'm not aware of any public statements made by Philip Morris referring to the Frank Statement at all.

Q Who, to your knowledge, was the first

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person representing Philip Morris in court, testifying, to say unequivocally that smoking is a cause of lung cancer?

A I have no idea.

Q Do you know of anyone before you who did so who was an employee of Philip Morris at any time?

A I have no knowledge one way or another.

Q Have you ever been told of anyone else who had made such a statement prior to your testimony under oath?

MR. COFER: Object to the form of the question; asked and answered.

A I don't know. It's never come up.

Q Since 1964 do you have any idea how many times some person employed by Philip Morris has testified in court or in a deposition that it has not been proved that cigarette smoking causes lung cancer?

A I have no knowledge one way or another on that.

Q Who is Cathy Ellis?

A Cathy Ellis is a scientist living in Richmond, Virginia.

Q Is she currently an employee of Philip Morris?

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A Not that I'm aware of.

Q Was she formerly an employee of Philip Morris?

A Yes.

Q Do you know during what years?

A She left the company a year and a half, two years ago, and she was with the company -- she and her husband moved to Richmond, I think, in '76. She did a post-doc at the medical school for a year or two. So she may have been with Philip Morris from late '70's, '78, '79 or '80, until 1999, sometime in '99, something like that, almost 20 years, plus or minus, in that time range.

Q Do you know whether she ever initiated any investigation to determine whether asbestos workers who smoked cigarettes have a higher risk of lung cancer than those asbestos workers who do not smoke cigarettes?

A I believe I do.

Q And what is the answer?

A I believe she did.

Q And do you know when she did that?

A I can only answer the question in the following way: She called me into her office, and she asked me to read some part of a document authored

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by Peter Lee relating to asbestos and smoking. It was an old document, and she asked me my opinion about that. I recommended to her that Peter Lee be hired to update this what appeared to be a very old report that analyzed the question of the joint effects of asbestos and smoking. She thanked me. I left the office, and I found out subsequent to that that she had asked Peter Lee to do that, and Peter did that. That report was submitted to a peer review journal and published. So that's about what I know what she did there.

Q When she called you into her office, that was in 1998, correct?

A I think so.

Q Do you know of anything she had done to investigate that issue prior to that time?

A I believe she had someone examine the Philip Morris internal documents to see what had been done over the years relating to asbestos and smoking, and I think she had some information put together on that, but I was not involved in that, nor did I see the folder that was put together on that.

Q Do you know whether in the past anyone at Philip Morris had ever investigated the issue of the percentage of asbestos workers who smoke?

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A I don't have a clear recollection of that information.

Q Have you ever heard of a person by the name of Jet Lincoln?

A Oh, yes.

Q Do you know Jet Lincoln?

A Only by his Jet-grams.

Q Have you seen any information that he attempted to put together at one time on asbestos workers who smoke?

A I've seen a large number of what we call Jet-grams that cover a whole wide range of things. I don't remember whether I -- I may have. I just don't remember.

Q Do you have an opinion as to the percentage of asbestos workers who have been shown to be smokers?

A Do I have an opinion?

Q Yes.

A I don't.

Q Is that something you have ever investigated in the past?

A I think I have, and I'd like to give you an answer, but I'm somewhat uncertain as to the numbers that are sort of rumbling around in my head

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right now with regard to that, whether they are representative of that -- of the socioeconomic status for those kinds of workers. My recollection is that it's in the ballpark, but I would hesitate to be any more specific. I could be in error.

Q Have you -- or do you recall testifying in the Felise case that by the early 1970's Philip Morris correspondence indicated that some 80 to 90 percent of asbestos workers were smokers?

A If I said it, then I said it.

Q Would that be something that --

A That I would have? I would have known.

Q Yes.

A Yes, but as I sit here today, that -- the preciseness of that number is just not in my head right now.

Q I'm looking at Page 3810 of the testimony from Felise. Let me read you this and see if it accords with your recollection: "Would you agree with me that by the early 1970's, your company's correspondence was reflecting knowledge that 80 to 90 percent of asbestos-exposed workers were also smokers? Answer: That was my recollection. I have seen that information."

Does that sound accurate to you?

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A If that's what I said, then --

Q Would you have any reason to not accept that now?

A No, but it would be somewhat comforting for me to go back and pull out the -- what the basis for that statement was that I made.

Q Philip Morris embarked on a program, I assume -- let me ask you for a date. Do you know when Philip Morris embarked on a program to attempt to remove benzo(a)pyrene from cigarette smoke?

A The answer is I think I do, and I think the place I would go back to is a Dr. Helmut Wakeham memo, 1961 presentation to the board; and to me, as I read it and interpreted it, that was one of several things I believe that he felt we should be working on to reduce or eliminate.

Q Was benzo(a)pyrene something that had been identified by the public health community as a cause of lung cancer?

A It was felt and it's still felt by some people within the public health community as being an important factor in cancer in the case of smokers, lung cancer.

Q And that would have been true in 1961, when Dr. Wakeham made that statement?

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A I believe so.

Q Was the company ever successful in that effort?

A The company has -- success, that's sort of an interesting point. The company has been able to reduce Benzo(a)pyrene in mainstream smoke over the years. Probably the best we've been able to do is in the electrically heated cigarette, where I think it's a 98-percent reduction. The use of filters in cigarettes, as they reduce tar, since Benzo(a)pyrene is found in the tar fraction, the particles that would be trapped in the filter, you basically have seen a 50-, 60-, 70-percent reduction just based on the use of cigarette technology. But the best we've been able to do is 98-, 99-percent reduction in the electrically heated cigarette that we have.

Q In the so-called conventional cigarettes, was the best you've been able to do something in the range of 50- to 60-percent reduction?

A Something like that.

Q As a result of that, would it be fair to state that you're still not able to state that a cigarette with reduced Benzo(a)pyrene in the range of 40 to 50 percent of what it was is, quote, safe, end quote?

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A Actually, I go back to the questions you asked me about Ellen Merlo's position. I don't think Philip Morris would find itself as a company standing alone making such a statement.

Q So you would agree; there is no safe conventional cigarette today, is there?

A That's correct.

Q Have you seen a document titled This Week colon Philip Morris, Dr. H.R.R. Wakeham, Vice-President Science & Technology, Philip Morris U.S.A., being interviewed by Peter Taylor, with Thames Broadcasting Company in London in August of 1976?

A I have been shown parts of this.

Q Do you know whether the company had -- let me hand you the document to look at, and I'll see if you recognize it.

MR. COFER: Did you want to mark this?

MR. FORMAN: Yes.

(Carchman Exhibit 4 is marked.)

Q There's a reference on Page 2 about no medical people working at the research center. Do you see that?

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A Yes. "Question: So you have no medical people working for you who can analyze the effect on the human body of the components of tobacco?" Okay.

Q Do you know whether prior to 1976 there had been any, quote, medical people, end quote, working at the research center who could have done that?

A You're not just asking me about employees of Philip Morris; you're asking me about working in the research center down the road?

Q I'm asking about people -- as I interpret what he said, and we can get into that if we need to, these would be employees of the company working at the research center.

A I'm not aware at that point in time of any medical doctors working in R&D.

Q When did medical doctors begin to work in R&D, if they did?

A Well, we've had -- we have three medical doctors working in the R&D organization. We have one right now in the Research and Development Center, okay? We have two at the research institute in Cologne, Germany. One of those has been there since 1971.

Q In Germany?

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A In Germany. And another one joined before I joined the company. When specifically I don't know. So we have had three physicians, three MD's. Two are currently employees; one is retired but a consultant.

Q And when was the first one employed?

A In '71.

Q In the U. S.?

A The first one in the U. S. is this year in Research and Development. We have on staff a medical doctor that deals with employee safety that we sometimes have interacted with, I think still do.

Q But he would have nothing to do with specific work dealing with the cigarette business as such, would he?

A Dealing with employee safety issues and -- with employee safety issues primarily.

Q His job would be the same if he was working for Philip Morris or the Joe Blow Company in effect?

A Could be. I don't know.

Q Now, if you'd look at Page 3 of that document, does Mr. Wakeham indicate that as of August, 1976, the company had no medical advisors specifically on smoking and health?

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A I see that, yes.

Q And to your knowledge, is that true?

A I don't know one way or another.

Q Have you ever talked to Dr. Wakeham about this issue?

A I have spoken to him -- I've met him twice, said "hello" and "good-bye" twice. Strictly social.

Q Turn to Page 11, if you will.

MR. COFER: Dr. Carchman, if at anytime you feel it's necessary to read the entire document to respond to Mr. Forman's questions, we'll take a break to do that. I'll leave that to your judgment as the questions are posed. If you are comfortable answering questions about the document without having read it, that's fine. If at anytime you want to read it, that's fine, too.

THE WITNESS: Okay, thank you.

Q Let me take a look at it one second. I want to ask you about the comment by Dr. Wakeham with regard to applesauce. Do you think it would be a fair context to compare people eating too much applesauce to people smoking cigarettes as a cause of disease or death?

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A If that's what -- if that's what he was doing, I would say it would not be a comparison I would make.

MR. COFER: For the record, what Dr. Wakeham says on Page 11 is, quote, Anything can be considered harmful, period. Applesauce is harmful if you get too much of it.

Q Are you aware of any reports in the literature, medical or scientific, suggesting people are dying from eating too much applesauce?

A I don't believe that was what he was saying. What he was saying here is a fundamental tenent in toxicology -- and Paracelsus, a Swiss toxicologist 400 years ago almost, said "*die dose macht alles*," the dose is everything, and that's what what Wakeham was saying here. I wouldn't have used applesauce because it then allows somebody to look at that and ask the kind of question you've asked. But it's a fundamental tenent of toxicology that enough of anything is not good for you, and I think that's what he was saying. I just -- I just think it was an unfortunate -- instead of taking applesauce, he could have taken something else. It's true; it's just an unfortunate example.

Q Let me see the document again for a

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second, please.

A Sure.

Q I'm turning now to Page 21 of the document. I'll ask you to take a look at that.

MR. COFER: Are you asking him to read the highlighted portion?

MR. FORMAN: He can read the whole thing.

Q My question to you, Dr. Carchman, is do you believe it would be appropriate in 1976 to suggest it had not been proved that cigarettes were harmful?

A Are you relating this to the highlighted --

Q First I'm just asking you the general question: Do you believe it would be appropriate for a company person like Dr. Wakeham, in his position, to indicate it had not been established in 1976 that cigarettes were harmful?

A Again, this gets back to -- I don't know if it was Mr. Cullman's point, where he used the word "harmful," and I basically said that's a fundamental scientific error, that you can never prove that; and therefore, one, it's impossible to prove this, and therefore you wouldn't say -- scientifically you wouldn't say this, whether it was about cigarettes or

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aspirin or, if you were really unfortunate and wanted to use applesauce. I wouldn't, but you can pick anything out there. You couldn't say this about anything.

MR. COFER: Couldn't say what about anything?

THE WITNESS: You couldn't say that -- you haven't proved that this is safe, that these things -- you can't prove the negative.

Q. In the abstract, you're saying?

A. Absolutely.

Q. But in the practical world, would you agree that the message Dr. Wakeham was conveying by his comments there in this interview was that it had not been established that cigarette smoking was harmful?

A. Not having spoken to Dr. Wakeham about this, I really can't convey exactly what his intent -- what his intent was. All I can say is from my scientific perspective, this is not -- you can't say this, but I haven't read this entire document. I don't know what his intent was. If he was saying that it hasn't been scientifically proven because we don't know what it is and how it's working, that could throw a different light on this; but since I

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haven't read this document, I haven't spoken to Dr. Wakeham about this, I can't answer your question in the fullness that it would require.

Q Do you see that he did comment "if the company as a whole believed cigarettes were really harmful, we would not be in the business"?

A Where does it say that?

MR. COFER: Why don't you just take a minute and read the entire page. Take a few minutes, because I think Mr. Forman has some other questions. You'll at least have the context of the statement.

THE WITNESS: (Reviewing document.)

A Okay.

Q My question to you is, do you think it would be appropriate in 1976 to suggest to the public through an interview that the company did not believe cigarettes were harmful?

A Well -- and I don't mean to quibble. It's not precisely what he said. He said "really harmful." I don't think he was saying that they're not harmless, but I would have to sit down and speak to him to figure out, you know, "Dr. Wakeham, what is it you really said here?" I can't go back and answer such a question of something that was written 25

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years ago without having spoken to Dr. Wakeham to figure out where he was coming from with this, what he was using as his underlying assumptions. But we wouldn't say this today.

Q In terms of conveying information to the general public through an interview, would you agree it's not likely to make much difference whether you say something is harmful or really harmful?

A I don't know. I would not have said this, but I'm not Dr. Wakeham.

Q Do you know of any other occasion when any employee of Philip Morris made a statement to the effect that if the company believed that cigarettes were harmful, they would stop selling them?

A I have been shown -- I think I've been shown documents that have -- I don't know whether they're -- I don't remember whether they're Philip Morris documents or somebody else's documents, where something like that may have been stated, but I can't remember with any specificity who said it, if they said it, or if this is -- what you've shown me is the sum total of it, but I have a feeling I might have been shown something like this before.

Q Do you know or did you know a Mr. James Bowling?

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A No, I've only seen his name in at least one document that's been shown to me in the course of litigation.

Q And was that the statement made in the *Wall Street Journal*?

A You'd have to show it to me. I only believe I've seen one document with his name on it. I don't remember where, which case or cases, and where that statement appeared.

Q I'll come back to it. How long has Philip Morris been testing its cigarettes to ensure that asbestos does not become mixed into the tobacco product in the manufacturing process?

MR. COFER: Object to the form of the question.

A I think for as long as I can remember and before I came to the company, there has been a group of individuals, and I've worked -- I've worked with them when I first came to the company, whose sole function in life was to make sure that foreign materials and/or materials that are used in the manufacturing process that could find their way into the product didn't. And I can't recall ever seeing anything specifically focusing on asbestos, but asbestos would be one of several materials that would

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not -- that people would pay attention to to make sure they would not end up in the product.

(Discussion off the record.)

Q So would you know when that actually started?

A No.

Q But it started before you came with the company in 1989?

A Yes.

Q You have not reviewed any documents that would indicate to you when that process might have started?

A No, I haven't.

Q Let me show you -- I asked you earlier about a statement by Cathy Ellis or asked you something about Cathy Ellis, and I'll ask you if you are familiar with her testimony given in the state of Mississippi case, so-called Attorney General's case, that she gave in March of 1997?

A I have not seen it, nor have Dr. Ellis and I ever discussed it.

Q Do you know what her position with the company was at that time?

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A The year now?

Q March 20, 1997.

A She may have been either vice-president or senior vice-president of Research and Development at that point.

Q Would you expect her to know whether Philip Morris had tried to find out whether asbestos workers who smoked cigarettes are at increased risk of lung cancer?

A Did I expect her to know --

Q In her position to know whether Philip Morris had tried to find out whether smoking asbestos workers were at an increased risk of lung cancer.

A I don't know one way or another. In 1997 I can only speak for myself. I can't speak for what she should or shouldn't have known.

MR. COFER: The question is whether you would expect her to know.

A I don't know.

Q Based on your knowledge of the corporate structure of Philip Morris at that time, who would be the person most likely to know whether the company had attempted to find out whether asbestos workers who smoked have an increased risk of lung cancer?

A The date becomes quite important, because

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she may have just been appointed to that position or just about appointed to that position, so it would have been her predecessor of which there are really two, and either one or both of them would have known, and in fact, I know one of them did.

Q And who was that?

A Dr. Jim Charles.

Q And he's deceased I believe.

A Yes.

Q I'm looking at her testimony from the state of Mississippi case, and the question is, "Has Philip Morris tried to find out whether asbestos workers who smoke cigarettes get a rapidly increasing rate of lung cancer to your knowledge? Answer: I don't know." Now, do you know whether Mr. Charles had investigated that issue as of March, 1997?

A He had retired in '94, '95, and my recollection is that Jim was -- Dr. Charles had some familiarity with the question and at least some of the literature at the time.

Q Have you seen any documents he's produced with respect to asbestos and smoking?

A I haven't looked. No.

Q Whether you've looked or not, you haven't seen any?

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A No.

Q She was also asked this: "Do you think if Philip Morris Research and Development Department concluded that asbestos workers shouldn't smoke cigarettes, that the asbestos workers should have been told that? Answer: If that conclusion was made." Would you agree with that?

A What am I agreeing with?

Q I'm asking if you would agree that if Philip Morris Research and Development concluded that asbestos workers shouldn't smoke cigarettes, that the asbestos workers should have been told that?

A They were told that, not by Philip Morris. Again, this is, to me, consistent with what Ellen Merlo was saying about -- and what Philip Morris is saying about where the health messages come from. The health messages come from the government and the public health community, not from Philip Morris. And in 1997, asbestos workers for many years before that had been -- had been told through OSHA bulletins and other things about the risks of asbestos workers with regard to smoking. So the question -- I mean, it had been done by others for many years before that question was asked of Dr. Ellis.

Q Is it your testimony Philip Morris would

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have had no obligation to pass that information on to asbestos workers?

MR. COFER: Object to the form of the question.

A No, I didn't say that, and if you're suggesting I did, I take exception. If Philip Morris knew something that the public health people, scientific people, the asbestos workers didn't know, I think Philip Morris would have a responsibility to let the authorities know of that. If they were aware of some unique piece of information that nobody else was, I think in that case we would have a responsibility to let people know.

Q Only if it was a unique piece of information?

A Unique in the sense that nobody knew that asbestos workers were at increased risk for lung cancer if they smoked.

Q Have you ever seen a transcript of an asbestos worker's testimony --

A No.

Q -- in an underlying case in which that asbestos worker has testified that I, the asbestos worker, was aware of the risk of lung cancer from the combination of smoking and asbestos exposure?

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MR. COFER: Object to the form of the question.

A I have never read any testimony by any asbestos worker.

MR. FORMAN: Let's stop for a minute and take a break, and we're going on to another area.

(Break taken.)

Q Dr. Carchman, to your knowledge has Philip Morris undertaken any study of exposure to whole cigarette smoke in animals combined with exposure to asbestos?

A I am not aware of any such studies.

Q Are you aware of any such studies that were ever undertaken through sponsorship of the CTR?

A I wouldn't know one way or another.

Q And I assume it would be fair to state at the company's research facility, that is, Philip Morris' research facility, in Europe, Inbifo, that no such studies were undertaken to your knowledge.

A I have not see any documents that would say they did that.

Q And if there had been such documents, you

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would expect to know about them, wouldn't you?

A Absolutely.

Q To your knowledge, has any other tobacco company undertaken testing of whole smoke with animals and asbestos exposure?

A I wouldn't know.

Q Are you familiar with the estimates of the numbers of premature deaths due to smoking each year as made by the Surgeon General from time to time?

A Yes.

Q And would you agree that they are now in the range of 400,000 according to the Surgeon General reports?

A Yes, those are the numbers that I read.

Q And do you agree with those numbers?

A I know where they got those numbers from. I understand some aspects of it. Whether they actually reflect deaths caused by smoking or they're related to smoke -- they're clearly related to smoking because these people were all smokers. Whether smoking actually caused it or not, I don't know.

Q Is it your testimony that you don't necessarily disagree with those conclusions of the Surgeon General; you just don't know one way or the

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other? Or do you in fact disagree?

A I'm not aware of the scientific basis for those numbers. It's a derived calculation. Whether those numbers are correct or not, I don't know.

Q Have you conducted any recent investigation of that issue?

A Specifically, I've looked at some other documents, for instance, the '96 Surgeon General's Report on Physical Activity, which basically concluded there's 300,000 excess premature deaths based on the lack of physical activity in the United States. When you start adding up all of these numbers from other health-related exposures or inactivity or diet, you end up with more people being killed or dying than actually die. But to say that I've gone into this personally in exquisite detail, my answer is no. I've looked at it and I'm convinced that it is a calculation-derived number and not based on any scientific examination of the information.

Q So to that extent do you disagree with it, then?

A Well, it may or may not be true, but not based on the assumptions that they make. You know, even a blind squirrel can find a nut, whether it's me or somebody else. I have no idea whether the number

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is true or not. All I'm telling you is that the basis for that number is not scientific.

Q Philip Morris does suggest to the public at this time that the Surgeon General is a reliable and credible source of information about smoking and health, doesn't it?

A Absolutely.

Q Are you aware of any independent medical organization which has concluded that the estimates of death from smoking by the Surgeon General are not substantially accurate?

A I would say there's no organization that I'm aware of that has done anything other than to repeat the numbers that the CDC Surgeon General has issued.

Q You indicated in your expert report, I believe, that you -- or not there, elsewhere. You have been involved in the design of the company website on smoking and health issues.

A Initially, yes.

Q What role do you play in that now?

A An *ad hoc*, *ad hoc* role. The latest change in the website -- I'm not going to use his name. I'll just use his title, because I don't know how to spell his name. But the president of Philip Morris

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U.S.A. called me up and basically said, "We're preparing to change the website. This is what the change is. These are my reasons. Are you comfortable with that?"

And I said, "Yes."

Q Can you spell that persons's name?

A No, but it's Mr. Semansik (ph.) It's one of those vowel-deprived names.

MR. COFER: But at the break, I bet we can come up with it.

THE WITNESS: I'm sure we can.

Q Now, this was in the year 2000?

A Yes.

Q And that was when Philip Morris said, "We agree with the overwhelming medical consensus that smoking is a cause of lung cancer, heart disease, emphysema and other diseases"?

A Yes, sir.

Q And prior to that time, there was a period in which Philip Morris reported that there is an overwhelming medical consensus on those issues, but didn't say, "We agree with that consensus"?

A Correct.

Q During what period of time was that position reflected on the website?

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A That's what appeared on -- if I understand your question, the first website that came out post fall of '97, the statement that Philip Morris made to Congress, that first website basically said that the Surgeon General, public health authorities, this is what they say. The first change in that website was what Mr. Semansik was calling me to tell me that they were about to do, and that is that this is Philip Morris' public position as well.

MR. COFER: He's asking you what time period.

A When did the website first --

Q (Nods head in the affirmative.)

A '98.

Q So would it be fair to state, then, from 1998 to sometime in the year 2000, the Philip Morris website referred to the overwhelming medical consensus of smoking causing the diseases we've discussed, and then in the year 2000 Philip Morris changed that statement on the website to say "we agree with the overwhelming medical consensus"?

A That's correct.

Q Did you have any input into the process of making the change to "we agree with the consensus"?

A Then I'm sorry, that is -- my *ad hoc* role

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was Mr. Semansic called me up and said, "We're, preparing to do this, the 'we agree' part. Are you comfortable with it?" So that's the *ad hoc* role. Prior to that, the initial website, I was more directly involved in that.

Q Did you urge the company, when you were initially involved in designing the language or working with the language to be used on the website, to say, "We agree with the overwhelming medical consensus"?

A My -- my position, when the website first came out, was question: Is that our position, or are we just providing information to the public, because it's not clear to me sort of where we stand on this? And I think I remember reading in the newspaper and seeing on the television people like Matt Meyers asking that question, you know, what does Philip Morris believe. And so I think that went into -- I mean, these questions from people like me and questions from Mr. Meyers on the outside led Mr. Semansic to say, "Well, let's make it -- let's take this argument out." And I think that was one of the reasons, though I can't speak to any of them with any degree of specificity, one of the reasons that he said, "Look, I don't want to argue about this. We

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don't want to argue about this. We agree."

Q Well, more specifically, though, did you recommend initially, when the website was created, that the company say, "We agree with the overwhelming medical consensus"?

A I did not.

Q Did anyone else to your knowledge?

A I don't know.

Q Obviously, nothing happened scientifically of such a magnitude between 1999 and 2000 that would have led to some scientific reason for having changed that statement to "we agree with the overwhelming medical consensus," did it?

A You're correct.

Q So this was simply a change in philosophy by the company?

A It was a change. I think the philosophical change had taken place before then, in the fall of '97. This was just evidence of the expression of that change, and this removed a question that had been asked about what is Philip Morris' position on these issues.

Q Do you know whether Philip Morris in any underlying tobacco litigation after January of 1999 ever took the position that it has not been

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established that smoking is a cause of lung cancer?

A I have no idea.

Q Did you participate in the formulation of any responses to interrogatories, for example, propounded to Philip Morris in which a question was asked about the company's position as to whether smoking was a cause of lung cancer?

MR. COFER: When?

Q In the year 1999.

A I believe I did.

Q And do you recall what your input was?

A To that specific question?

Q Yes.

A I'd have to go back and you'd have to show me the specific interrogatory. I mean, if I was involved in that case, then I generally was shown the interrogatories and proposed responses and asked to comment on them.

Q To your knowledge has Philip Morris admitted in any specific case, that is, a tobacco case filed by an individual against Philip Morris, that that individual's lung cancer was caused by exposure to cigarette smoking?

A I have no knowledge one way or another to answer that question.

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Q Are you aware of any specific case in which Philip Morris has admitted that any disease, that is, in a specific individual case in which a smoker has made a claim against Philip Morris, that that smoker's disease was caused by smoking?

A I have no way to answer that question.

Q Have you ever made inquiry to determine whether Philip Morris has ever made such an admission in a specific individual case?

A I believe for those cases that I was specifically involved in, I would say the answer is yes.

Q You did make inquiry?

A Of course. I was intimately involved in terms of addressing some of those questions.

MR. COFER: Now, I'll tell you, we're getting perilously close to the Work Product Doctrine and attorney-client privilege. I haven't interrupted at this point, and I don't think we've gotten there yet. I just wanted to alert the witness to be sure and allow time between Mr. Forman's questions and your answer in the event that I need to instruct you not to answer.

THE WITNESS: Thank you.

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Q Do you ever review the details of any individual cases for the purpose of making a recommendation as to whether the company should in a specific case admit that the disease claimed is caused by cigarette smoking?

A Could you repeat the question, please.

Q Let me ask it this way, then: If a case is filed against Philip Morris, and the plaintiff claims that he or she has lung cancer and it's due to smoking, would you ever be -- or would your work ever encompass actually looking, for example, at medical records or scientific reports specific to that case for the purpose of making a recommendation as to whether the company should take the position in that specific individual case that smoking was or was not a cause of the lung cancer?

A I can answer -- try to answer part of that. I can think of at least one case, individual case, where I was shown scientific information obtained from biological samples derived from the plaintiff that purported to demonstrate a causal link between her lung cancer and exposure to, in this case, environmental tobacco smoke. I then did my own evaluation of that scientific report and then looked in the literature and in some databases on this, and

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I concluded -- and I let --

MR. COFER: Don't tell what you concluded. In fact, I'm going to instruct you not to answer this question from this point forward. Counsel's question -- I'm not sure it's intentional -- is asking for the work product by a party in preparation of litigation, in addition I think implicitly asks for communications with counsel. So I think it intrudes on both the Work Product Doctrine and the attorney-client privilege. So I'll instruct you not to answer any further the question what you do to help prepare for an individual lawsuit.

MR. FORMAN: I would disagree with your instruction, but we can take that up with the Court later.

MR. COFER: And I'll tell you, I've tried and I am trying real hard not to interrupt and to let him answer to the extent that it's not invading the privilege; but clearly, I need to be careful to make sure that we don't result in any waiver.

Q Are you familiar with any interrogatory responses filed by Philip Morris or an answer to a

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complaint filed by Philip Morris in a case called Simon versus Philip Morris?

A I may. I don't necessarily keep track of these. Can you give me some information about Simon?

Q I have some information from the web that I'm going to show you that purports to be an excerpt from an Answer of Philip Morris to the Plaintiff's First Amended Class Action Complaint.

MR. COFER: When you say "from the web," from Philip Morris' website or just something you gathered from the internet?

MR. FORMAN: I think it's got it up here, but we'll mark it as an exhibit, and I'll show it to you.

(Carchman Exhibit 5 is marked.)

Q My question to you, Dr. Carchman, is whether in November of 1999 a statement in an answer, which says it has not been scientifically established that smoking causes lung cancer -- I'm not trying to quote the exact language, but the gist of it there, would that be in accord with the position taken on the company website as of that time?

MR. COFER: Read that question back,

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please.

Listen to that question.

(Court reporter reads back previous question.)

MR. COFER: Your question, Mr. Forman, does not pertain to Exhibit 5, or it does?

MR. FORMAN: It does.

MR. COFER: So you're representing that this is in fact an answer that was filed by Philip Morris in the Simon case?

MR. FORMAN: Sofar as I know, based on that information on the website. If it turns out that I'm incorrect, then obviously we'll withdraw that.

MR. COFER: Okay.

Do you understand the question?

THE WITNESS: I think so.

A As I understand our position in this matter as it relates to public communication, we defer to the public health community; but in those situations in which we have to defend ourselves, as in litigation, that allows us to step outside of that role because that's -- the view is -- I think the view within Philip Morris is litigation,

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regulatory-type issues, allows us to be more explicit in terms of our scientific understanding of things; but as it relates to issuing statements or saying things that would impact the public, we would defer to the Public Health Authorities, to the government.

So I think the statements I've seen from the company make that distinction, and that's how I'm interpreting this. This is not a statement made to the public. This is in response to a specific question within the context of litigation. If this were a regulatory-type question, we might produce a similar response; but if you were interviewing me on television, I wouldn't say this.

Q Do you think it is appropriate, now that the company has stated on its website that it agrees with the overwhelming medical and scientific consensus that cigarette smoking causes lung cancer, to say in pleadings filed in a legal matter that it has not been scientifically established?

A I think it is, and I think there are -- and the reason I think it is, I think there are sound reasons for examining questions this particular way -- rather, responding to questions in this particular way, because we're not dealing with communications to the public about whether you should

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smoke or not.

Q So would it be fair to state, Dr. Carchman, that you do not see any contradiction in stating that you agree with the overwhelming medical and scientific consensus that cigarette smoking causes lung cancer on the one hand, but to state on the other it has not been scientifically established whether cigarette smoking causes lung cancer?

A They are saying different things to me. The purpose for the public position is different than the purpose for this response, the nature of this response.

Q We talked a little bit earlier about the Institute of Medicine.

A Yes.

Q And I believe they have been working on a publication called "Clearing the Smoke" --

A Yes.

Q -- that you have acted as a consultant for.

A Yes.

Q And I assume you have reviewed the publication.

A Actually, the only thing that exists is

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not the finished product, but an advanced copy. And so yes, I have reviewed it, but I'm waiting to see the final version.

Q I'm going to ask you some questions based on the version that's available to the public now, and I'll ask you if you agree with them or whether you expect there to be any change in that position as of the time this is made available in an official publication.

A So two questions: Do I agree --

Q I'll do that as we go through it. First of all, let me ask you this: Are you aware of any specific conclusions that are contained in the current version that's available on the internet from what you expect to be published, as I understand it, in the next month or so; is that correct? I mean, it will be published in the next month or so?

A That's my understanding as well.

Q Now, are you aware of any changes from any of the conclusions as we sit here today that you anticipate being made in the final version, so to speak?

MR. COFER: Are you talking about changes between what's currently expressed in this draft you have in front of you --

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MR. FORMAN: Yes, correct.

MR. COFER: -- and what he anticipates the final version will be?

MR. FORMAN: Better stated.

A I wish I knew the answer to that. I hope not, but I don't know.

Q I'm going to read some of the statements to you from it, and I'll ask you if you agree with them, so you'll know where I'm coming from. I'm looking at Page 1 of the Executive Summary. It says "Tobacco smoke is the cause of the most deadly epidemic of modern times." Do you agree with that?

A Well, to use the word "epidemic," it's poetic license, I guess. It is not based on any medical or scientific concept. It is a dramatic use of a word. And in terms of the statement, that's their position. Do I personally think that tobacco and smoking and health are very important issues? Yes. To that extent I agree with that.

Q "The vast majority of smokers began tobacco use during adolescence." Do you agree with that?

A That seems to be what the data indicates.

Q It says, "However, 70 percent of smokers say they want to quit, and 34 percent of smokers make

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an attempt to quit each year." Do you agree with that?

A Based on what's been published in the literature, based on the kinds of questions that are asked, those are the kinds of responses that people have reported.

Q "There have been many efforts in the past to develop less harmful cigarettes, none of which have proved to be successful." Do you agree with that?

A With the context. Have there been improvements? Yes. Have they gone far enough? Clearly not.

Q "One of the first innovations with the promise of harm reduction was the development of cigarettes with filters." Is that why filter cigarettes were developed?

A I think filters, based on scientific and epidemiological information, were thought, and I think in most circles continue to be thought of as an attempt at harm reduction, yes.

Q It says "The next major modification of cigarettes with safety implications was, quote, low yield, end quote, cigarettes."

A Yes.

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Q You agree with that?

A I don't know if it was the next, but it was another.

Q "Many consumers believed and still do that these products pose less risk to health than other cigarettes."

A I have -- I've heard that, but I have not reviewed the literature to be able to say -- to be qualified to say whether they do or don't.

Q "Most current assessments of morbidity and mortality suggest that low-yield products are associated with far less health benefit, if any, than would be predicted based on estimates of reduced toxic exposure using FTC yields."

A I generally agree with that statement.

Q Do you agree that people who continue to use these products have not significantly reduced their disease risk by switching to them?

A The key word for me is "significant," and to go beyond the Executive Summary, to the data they used to draw that conclusion is both the '81 Surgeon General's Report and I think it's '96 FTC Monograph No. 7 by the NCI, which then refers back to the '81 Report, which shows a reduction in lung cancer risk. So in '96 they're still basically referring back to

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that.

The key point, significant -- and I don't want to take up an enormous amount of time, but it's very important. The risk reduction that people have seen is 20 to 50 percent. Now, do I believe that's real? Yes, I believe that's real. The problem is the question of significance. And significance, for the public health people as well as for Richard Carchman, is the following: If you have a relative risk for lung cancer of ten, if you're a smoker and you reduce that risk by 20 to 50 percent, the residual risk from a public health perspective is still too large. So I believe that's what they're talking about, and if indeed it is, then I agree. There's been a reduction. We need to do better.

Q You indicated there the FTC Monograph No. 7.

A Yes.

Q You're aware that there's a new FTC Monograph about to be published on low-tar cigarettes?

A I'm not.

Q Monograph 14, you're not familiar with that?

A No, I may have seen parts of it, but I'm

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not, no.

Q Would you agree that by and large the literature published in the last five years would indicate that the extent of the reduced risk for lung cancer from the so-called low-yield cigarettes is less than 20 to 50 percent?

A Less than 20 to 50 percent? The literature that I have reviewed and a manuscript that I have reviewed that's about to be published that has reviewed 50-something studies on a worldwide basis continues to say 20- to 50-percent reduction in lung cancer risk.

Q How many carcinogens to your knowledge have been identified in cigarette smoke?

A I'm asked this question, I think, just about every time. There have been identified in cigarette smoke animal carcinogens and carcinogens listed as known to be human carcinogens, and there might be four dozen plus of these things.

Q And how many are specifically identified as human carcinogens?

A A dozen or so.

Q Would you agree there is currently no evidence to support a threshold level of tobacco exposure below which no risk exists?

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A No.

Q You don't agree?

A No.

Q Would you expect that kind of conclusion to be changed in the final version of "Clearing the Smoke" by the Institute of Health?

A Absolutely not.

Q So you're just in disagreement with them on that?

A Oh, yeah.

Q Would you agree that no currently available potentially reduced-exposure products have been shown to be associated with biologically relevant exposure reduction or with decreased tobacco-related harm?

A Yes.

Q Do you agree that the biologically active component in tobacco that is primarily responsible for tobacco use is nicotine?

A I think -- do I think nicotine is important? Yes. Do I think it's the only thing that's important in smoking? No.

Q Do you think it's the biologically active component that is primarily responsible?

A It's a biologically active component. It

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is important. Is it the only thing? No. Is it the primary thing? I don't think so.

Q I'm looking at Page 1-5, discussing low-yield products. It says "The sales weighted average of tar and nicotine yields of cigarettes in the United States has decreased by approximately half since the 1950's." Do you agree with that?

A Yes.

Q "Without a significant or proportional change in the harm or prevalence of specific smoking-related diseases."

A Well, as far as I'm aware of, other than lung cancer, there's no information out there since 1986 that addresses anything other than lung cancer, and I think I've addressed the point about significant, where I agree and where I disagree.

Q I'm now looking at Page 3-3. I'll ask if you agree with this, again, still talking about the low-yield products: "The weight of the evidence indicates that lower tar and nicotine yield cigarettes have not reduced the risk of disease proportional to their FTC yields in part because smokers compensate to obtain more nicotine and in part because the products themselves contain higher concentrations of selected carcinogens."

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A You're asking me to agree or disagree?

Q Correct.

A It has multiple parts to it.

MR. COFER: Do you need to see the statement?

Q I'll be glad to show it to you.

MR. COFER: Why don't you look at it, because it is a complex sentence.

THE WITNESS: Yeah, it is. I've actually spent a lot of time on it.

MR. FORMAN: Just the last thing I've highlighted on the page.

(Off the record.)

MR. COFER: Would you read the question back, please.

Q I think, just to save time, I read that quote and asked if you agreed with it.

A It's a multipart. "The weight the evidence indicates that lower tar and nicotine yield cigarettes have not reduced the risk of disease proportional to their FTC yields."

MR. COFER: So it's clear, you just read this from the text.

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A I read this from the text, 3-3 under "Health Impact of Low Yield Products." Do I agree or disagree? I agreed before when you asked me this question. I agree with it. I agree with it now. "In part because smokers compensate to obtain more nicotine," and then they provide two references. I would say that may or may not be true, except in the FTC Monograph No. 7, Dr. Samet I think correctly points out that the epidemiological studies from which this is derived from naturally take into account whether or not people compensate and how, and you still see a 20 to 50 percent.

Would you have seen a greater reduction if compensation was not an issue? That could very well be. Nobody knows. The information on compensation that's been published by Benowitz and others is that compensation occurs. It's temporary. It goes away early.

So there are parts of this I agree with, but as it relates to this question, parts I agree it, parts I disagree with. Okay.

The last part, "and in part because the products themselves contained higher concentrations of selected carcinogens," and this refers to the Hoffman, et al. chapter in FTC Monograph No. 7, okay?

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Now, I'm not exactly sure what they're referring to. When you look at that chapter, okay -- I don't have it in front of me, but it's still rattling around in here -- my recollection is there's only one carcinogen that Hoffman, et al. report in that chapter in '96 that's going up as a function of time. It's tobacco-specific nitrosamines are going up, Benzo(a)pyrene is going down.

Let me just point out that if that is indeed what they're referring to, then the more appropriate reference is Hoffman, 1999, *Health Canada*, where the TSNA levels are going down. Let me further add, if indeed that's what they're talking about, because they never specifically speak to it here, that that graph in the '96 publication is a measurement of non-filtered -- one brand of non-filtered cigarettes that they picked up at a store near the American Health Foundation -- now, non-filtered cigarettes represent less than one percent of the commercial marketplace in the United States, and if one tries to make a general statement because of the higher concentration of selected carcinogens, I would say that is a specious -- a specious argument, but they don't really say here what they're referring to. And my recollection in

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the Hoffman chapter of their -- the only thing they're referring to is tobacco-specific nitrosamines, which are from a product that is not really a part of the commercial marketplace in any meaningful way in the United States.

Q So with that explanation, you would disagree with the last portion of that statement?

A Within the context of my answer. In those -- whatever cigarettes they were, those non-filtered cigarettes, in '96 this was going up; but in a more recent publication, which was available to them -- for whatever reason they decided not to cite it -- this is no longer true.

Q Now, let me ask you to turn to Page 1241. Do you see a statement there about "The available data are suggestive but not sufficient to conclude that smokers of so-called low-tar cigarettes have a lower cancer risk compared to those who smoked higher tar cigarettes"?

A "The available data" -- I'm reading from 1241 -- "are suggestive but not sufficient to conclude that smokers of so-called low-tar cigarettes have a lower cancer risk compared to those who smoke higher tar cigarettes, with the same caveats as for filter smoking studies." I see that.

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Q Do you agree with that?

A Well, again, if you look at the references, not in this section, that they use here, they cite back to the '81 Surgeon General and to the '96 FTC Monograph No. 7, and for both filter slash low tar, within that context -- you and I really haven't discussed what low tar is. I think -- they don't say what the caveats are, but the '81 Surgeon General and the '96 FTC Monograph No. 7, which refers back to this, say what I've said before, that there is an apparent 20- to 50-percent reduction in lung cancer risk. I'm not talking about any other -- any other disease, because no other diseases have been evaluated the way lung cancer has with respect to filter, non-filter, higher tar, lower tar.

So I can't simply say I agree or disagree. There are elements of this that I think I agree with. There are other elements that I think are not clear enough, clearly enough stated, for me to agree or disagree.

MR. COFER: Rick, I don't want to interrupt your flow, but it's about ten till noon. You might look for a place to break. There's a cafeteria next door, so we can have a fairly quick lunch.

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MR. FORMAN: All right, I'll do that. We're going to come back to that in a minute, but --

Q And maybe we can save some time on this. In the 2000 Surgeon General Report, they also addressed the low-tar cigarettes, and so maybe before I ask you about that, how do you define the low-tar cigarette, since you brought that up a moment ago?

A It's depends on your point of reference in time. Therein lies, I think, an important issue, whether it's something we can really talk about here or not. Depending upon when the study was done, a low-tar cigarette then is now a high-tar cigarette today, okay?

So the first studies that were done in the early '60's at Roswell, basically did filter, non filter, so you were dealing with almost 30 milligrams of tar versus 20 milligrams of tar. By the time you got to the '70's, what was the low tar then was the high tar then, so you were talking about 16 milligrams. And so today, as you indicated earlier, the sales-weighted tar average using FTC methodology is around ten, okay? So that would be the low tar. And you would compare that to what, okay? You would compare it to a 16 milligram, which would be the high

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tar today.

If you asked the question, what about filter versus non-filter, if you look, as a function of years along the bottom and FTC tar yield on the top, filtered cigarettes have lower FTC yield than non-filtered cigarettes. So in my mind, when I see filter versus non-filter or high tar versus low tar, I immediately have this picture, which doesn't necessarily come across here unless you know the literature and the history.

The ultra low tar, as they say here, which would be below seven, there is no information on, and so I would frame this from that perspective. The issue for the public health community, as I see it with regard to low tar, is one -- as you stated, the notion that some smokers believe there's some benefit associated with low tar. From a public health perspective, they would much prefer people that wanted to quit, quit, and not switch, because there's still risk, and that risk, though it may be reduced, is still unacceptable.

So that's the dynamic that plays out here, and that's what in the 2000 report the Surgeon General is talking about, and in 2001 that's what they're talking about as well. I mean, that's the

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framework I have in my mind in this whole area.

Q Well, do you have a number in your mind that you would consider overall to be, quote, low tar versus high tar or where the cutoff would be? Is there one general number you could use?

A The data is such, as it's been collected over the last 40 years, you need to look at that. I have looked at it. And your question, I think, is -- if I understand it, is very important. If you asked the question, based on epidemiology how does the relative risk change as a function of years, okay, so if you look at the data from the '60's and you look at the data from the '90's, what you generally see -- I don't mean in every, single study, because in some studies you don't see it. You see this 20- to 50-percent reduction in lung cancer risk.

If compensation was a critical issue or as -- if they suggest Hoffman is saying in that other page you showed me, there are more carcinogens, my prediction would be epidemiology is sensitive and robust enough, that if these things were going on, this risk overall would decrease; and it's remained relatively constant over the last 40 years, which is good in one sense, in terms of the questions of compensation and more carcinogens, but bad -- or not

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good enough really, not good enough in the sense that the risk really hasn't -- hasn't come down for whatever reasons. I don't think anybody understands. The compensation question, that's a guess.

Q Are you saying the relative risk of lung cancer over the last 40 years for smokers has remained relatively constant?

A No, no. If you think I said that, that's clearly not what I'm saying. What I'm saying is that published epidemiological studies that compare the risks between smokers of high tar to low tar, filtered and non-filtered, you still see this band of 20- to 50-percent reduction in risk. That's what I'm saying. Other things are changing. The baseline is changing, but the relationship between those two variables appears to be relatively constant. But let me make sure I'm clear here, the change is not as large as we would like it to be.

Q Let me ask you this: Do you recall in the Surgeon General Report for the year 2000 they used the phrase that there were, quote, only slightly lower risk, end quote, using these low-tar products?

A Yes, sir.

Q And would that be what you would consider to be the 20- to 50-percent reduction range?

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A Yes, sir.

MR. FORMAN: All right. This would be a good stopping place, I think.

(Lunch break taken.)

Q A few more questions from this Institute of Medicine book. I'm looking now at Page 3-11. I'm going to ask you if you agree with this statement: "Studies on risk perception indicate that smokers tend to underestimate their overall risk from smoking."

A I remember reading it. I don't have -- I'm not in a position to say whether I agree or disagree. I just don't know.

Q "A large proportion of smokers considers smoking low-yield cigarettes to be safer than smoking regular cigarettes, even though evidence does not support such a conclusion."

A I have no information to be able to comment on it one way or another.

Q Menthol and additive-free cigarettes, which likely pose as much risk respectively as non-menthol and additive-containing cigarettes, also seem to be perceived as somewhat safer."

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A That's a two-part question. Whether menthol/additive free may or may not be safer, I don't know if there's any information, so I might agree with them that there really is no difference. The second part of that I'm just not -- I don't have enough knowledge to answer that one way or the other.

Q Let me show you a document. I should have another copy, but I don't know where it is. I'll show you this one. It's called "Special Report 248 Market Potential of a Health Cigarette," and it's signed by M. E. Johnston, Jr., and W. L. Dunn, Jr., dated June, 1966, and I'll ask if you're familiar with that.

A I believe I've seen this within the context of litigation before.

MR. FORMAN: I'm going to have that marked at the next extent, and I'll ask you a few questions about that.

MR. COFER: Did you intend to mark the IOM report?

MR. FORMAN: Not necessarily. I don't mind doing it.

(Discussion off the record; Carchman Exhibits 6 and 7 are marked.)

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Q Do you know either Mr. Myron Johnston or Mr. W. L. Dunn, Jr.?

A I knew Myron. He was an employee of Philip Morris R&D.

Q Were you familiar with this effort to develop a, quote, health cigarette, end quote, in this time period of 1966?

A I was, again, as I said earlier, aware of this document and those things that surround it as a result of litigation.

Q On Page 2 of the document in Paragraph 10, there is a reference that says "The illusion of filtration is as important as the fact of filtration." Do you think it would be appropriate to market a cigarette giving the illusion of filtration to the public?

MR. COFER: Do you want an opportunity to look at the statement in context?

THE WITNESS: Please.

A (Reviewing document.) Please repeat the question, Mr. Forman.

Q Do you think it would be appropriate to market to the public a health cigarette with the illusion of filtration?

A If that indeed is -- they were talking

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about marketing a health cigarette and the health was illusory, clearly that would be nothing we would be involved in today. Whether or not they were actually talking about this this way, I don't know.

Q Do you recall there being anything in the document that would suggest that a health cigarette should be marketed for the benefit of the actual health of the smoking public?

MR. COFER: If you're going to answer that question, you're going to have to look at the document unless you have recall of it.

A That's pretty much what I was going to say. I would need to sit and look at the document. I don't think I've ever had a chance to look at the entire document.

MR. COFER: It's up to you. We're happy to have him do that if you want. Your call.

Q Just look at the document and let me ask you another question, then. I'm looking at Page 3 at the top, under -- it says "Recommendations."

A Yes.

Q The first paragraph, "Our posture with regard to a health cigarette entry should be determined by anticipated political market conditions." Do you see that?

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A Yes.

Q And that he recommended in the third paragraph "we not introduce a new health cigarette unless there is another health scare or additional restrictive legislation is passed." Is the health scare he refers to the one that followed the Surgeon General Report of 1964?

A I've never spoken to Myron about this. I don't know. It's possible.

Q Now, if you look at the bottom of the page, again, Page 3, the last paragraph, "In the absence of legislation or a resumption of the tar derby, LongPar would probably be the best entry, since it is without question a radically different method of filtration and can be made to give the illusion of filtration without impairing the tobacco flavor." Do you know whether Philip Morris proceeded to develop any cigarette for that purpose, that is, to give the illusion of filtration?

A And to the extent that I know, I think the answer is no.

Q Do you know whether they did not do so because of an inability to develop it or for any ethical or moral considerations?

A I know what I would hope, but I don't know

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the answer to your question.

Q Do you see on Page 4 he defines a health cigarette at the bottom of the page as "All cigarettes about which health claims have been made or implied," and he puts in parentheses "charcoal filter cigarettes: Kent and Parliament and minor brands such as Duke, Life, Sano and True"? Now, Philip Morris introduced what they call multifilter charcoal filter cigarettes I believe in the 1960's.

A I believe that's correct.

Q And do you agree that those cigarettes were perceived as health cigarettes by the public?

A I don't know the answer to that question.

Q Do you know the intent in marketing those cigarettes?

A My -- based on my experience with the company, the intent of offering up these kinds of products were driven by what in focus groups -- I'm sure they didn't have focus groups at this point, but the concept of asking people what they were looking for. People would come back and say, "We think this is the kind of cigarette we would smoke," then Philip Morris would try to develop that cigarette.

Q Do you know whether Philip Morris marketed the charcoal filter cigarettes as providing greater

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filtration than ordinary filter cigarettes?

A I don't know.

(Off the record.)

Q Looking, Dr. Carchman, at Page 7, the last paragraph: "The health scare in 1964 was undoubtedly the cause of the cigarette sales decline, the accelerated shift to filters, and the 126-percent increase in sales of charcoal filters." Do you have any information that would suggest that is inaccurate?

A No.

Q Did Philip Morris ever market a cigarette known as LongPar?

A No.

Q Do you know anything about that brand, how far it got in development?

A I don't think it was ever a brand. It may have been a prototype.

Q Now, looking at Page 16, the first full paragraph, "The spread of" -- I'm sorry, "The speed with which charcoal filters penetrated the health cigarette market shows the effectiveness of a new concept. The public has been conditioned to accept

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the filtering effects of charcoal in other fields, and when charcoal was added to cigarette filters, it proved to be an effective advertising gimmick." Do you know whether Philip Morris told the public at any time that the use of charcoal filters was an advertising gimmick?

A I don't think it told the public that it was a health cigarette or anything else, but you're asking me a marketing question. I'm just not knowledgable in that area. I don't think Philip Morris said -- I have not seen anything Philip Morris said. Now, there might be some marketing documents out there, but I wouldn't be the person to ask that question to.

Q Do you know whether the charcoal filter cigarettes were ever demonstrated in any reliable scientific testing to provide any greater filtration than normal filters?

A The study we were talking about earlier, where I indicated we were testing nine of our products, and I said one of them was a charcoal filter, that was a Parliament, and this is -- I mean, other people have seen this, too. If you do look at the smoke constituents that come out, the charcoal does have a somewhat selective effect on a variety of

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smoke constituents that have been a concern in addition to what you would see over a cellulose acetate filtered cigarette. So that's not new news, but just to tell you, in 2001 in a charcoal filter cigarette we sell in the United States, there's a smoke chemistry difference, and that's reflected in some of the biology.

Q What proportion of Philip Morris brands use a charcoal filter?

A I don't know. I'm aware of -- in the United States?

Q Yes.

A Parliament.

Q That's it?

A Again, you're asking the wrong person, but I believe it's at least Parliament. I don't think there are at this point very many charcoal filter cigarettes that Philip Morris sells.

Q Let me show you a document that's dated March 24, 1961, titled "Trends of Tar and Nicotine Deliveries Over the Last Five Years," and I'll ask if you're familiar with that.

(Carchman Exhibit 8 is marked.)

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A I may have seen a document like this as a result of litigation.

Q Now, do you see the reference in the document that, "As we all know, all too often the smoker who switches to a hi-fi cigarette winds up smoking more units in order to provide himself with the same delivery which he had before. In short, I don't believe the smoking pattern has changed much, even with cancer scares and filtered cigarettes"? Would that be an accurate state of affairs as far as you know within the company in 1961?

A I have no way of answering that question.

Q Do you have any information to suggest this was incorrect?

A I have no information one way or the other.

Q Let me show you another document. It says "From: R. Fagan, To: Dr. H. Wakeham," dated September 2, 1970, "Subject: Biological Significance of 'Tar.'" I'll ask you if you have seen that document. We'll have that marked as the next exhibit.

(Carchman Exhibit 9 is marked.)

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A I believe I have seen this document as a result of litigation.

Q I'd like to ask you a question about that document. Who is R. Fagan?

A Dr. Ray Fagan was a scientist in Research and Development, and I believe one of his major responsibilities was following smoking and health literature for Dr. Wakeham.

Q Do you know what period of time Dr. Fagan worked at Philip Morris?

A Before I came he was getting ready to retire.

Q Do you know what his background was?

A He's a veterinarian, I believe.

Q And he was following the smoking and health literature for Dr. Wakeham?

A He was one of the people that was doing that, yes.

Q Were there any medical doctors that were doing that for Dr. Wakeham?

A I don't know.

Q This document indicates that "Smokers determine how much smoke they take in," dash, "not the cigarette. In the last 15 years, particulates in cigarette smoke have declined by 33 percent; however,

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the number of cigarettes per smoker has increased. Furthermore, experimental studies have shown that a smoker will increase the number of cigarettes he smokes if the cigarette he is offered contains less particulates and less nicotine." Do you have any information that would suggest this information is incorrect?

A I'm not aware of any information that supports what Fagan is saying there.

Q Are you familiar with any information existing at the time to suggest it was not correct?

A I can't create knowledge from ignorance.

Q Do you know if anybody made any reply to this memorandum which indicated this was incorrect information?

A Again, I've only seen this memo as a result of litigation, so I don't know what else exists in the file regarding this.

Q Now, this -- you say you've seen the memo in the context of litigation, but I think you would agree this document was not generated in the context of litigation.

A I don't know. I would guess in the normal course of Dr. Fagan's work, he would comment to Dr. Wakeham about some things he thought were

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important.

Q Is the concept he's discussing here what's been described in other literature as smoker's compensation?

A I believe that's what he's referring to.

Q That is, if they smoke a lower-delivery cigarette or so-called lower-delivery cigarette, they might take more puffs per cigarette or deeper puffs?

A Or smoke more cigarettes.

Q Or smoke more cigarettes.

Next let me hand you a document dated September 17, 1975 from Barbro Goodman to Leo F. Meyer, subject: Marlboro dash Marlboro Lights Study Delivery Data, and I'll ask you if you're familiar with that.

A Yes, I am.

MR. FORMAN: Let's have that marked.

(Carchman Exhibit 10 is marked.)

Q What is the subject of that document?

A It's Marlboro Lights Study Delivery Data, and they're looking in human smokers at some surrogate parameter for delivery with these so-called light cigarettes.

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Q And do you recall what the conclusion was?
A Actually, there were three studies, and I don't think it's fair to talk about any one, but you need to talk about all three. And if you had all three, there are two Barbro Goodman, and there's a third one from somebody else.

And my recollection is the two Barbro Goodman documents, the conclusion is they agree with each other; but if you look at the data, they don't. There's a clear misrepresentation in the summary that they've replicated it. And the third study was equivocal.

So in not just reading words, but actually examining the data, you find three Philip Morris studies on the same topic, one showing compensation, one not showing compensation, and the third one being equivocal, not being able to tell one thing or the other.

So for me this was a wash. Whether it was a wash because their technique or technology were inadequate, the number of subjects were inadequate, or the kinds of subject they were looking at was inadequate, I don't know. I've talked to some folks that were involved in this, and we pretty much -- I pretty much concluded that you couldn't make any firm

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conclusions about what -- what scientific reality was with these studies.

Q Does the document indicate that "The smoker data collected in this study are in agreement with the results found in other project studies"?

A I said that's the conclusion, but the data are not in agreement with that.

Q Does the -- the inter-office correspondence, does it indicate at the end on Page 3 that "In effect, the Marlboro 85 smokers in this study did not achieve any reduction in smoke intake by smoking a cigarette," parentheses, "Marlboro Lights normally considered lower in delivery"?

A One study found that. One study didn't, and the third study couldn't tell whether there was or was not an effect in reduction.

Q Did the document conclude that, "Conversely, Marlboro Lights smokers did not increase their smoke intake when they changed to the regular delivery cigarettes"?

A In that one study, yes.

Q Who is Clifford Goldsmith?

A Who is Clifford Goldsmith? He's a retired executive of Philip Morris.

Q And what positions did he hold with the

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company?

A Very high positions within Philip Morris. He was what would be termed senior management.

Q Do you know his specific title?

A I think for a while he was the head of operations, and he may have actually been even higher, higher than that.

Q Have you seen the document he prepared called "Cigarettes and the Cardiac-Cancer Cartel"?

A I don't know. I'd need to see the document.

MR. FORMAN: Let's have that marked as the next exhibit.

(Carchman Exhibit 11 is marked.)

A It doesn't look familiar, but I would have to look. I may have been shown parts of this at various times.

MR. COFER: Is there some place in the document where it says -- you say Cliff Goldsmith wrote this?

MR. FORMAN: I think so. If you look at the end, I think it's --

MR. COFER: Okay, his name is at the

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bottom. Thank you.

A I think I would have remembered the title, but I may have been shown parts of this, but it doesn't rise up out of this table and say "My, God, I've seen this," but --

Q In the second paragraph of the letter, and I don't see that -- yes, it is Page 1. They are numbered at the top. He states, "Even more critical, however, is the real possibility that the anti-smoking programs of the public and private health agencies are more hazardous to public health than smoking itself." Would that be a statement that you would consider to be erroneous?

A I think that nobody today in Philip Morris would make such a statement.

Q He further says on Page 1 "To justify such extreme measures, anti-smoking agencies have created a morass of misinformation and apparent fraud." Are you aware of any claim by anyone not associated with the tobacco industry that there was a morass of misinformation and fraud about the dangers of smoking?

A Without -- yes, I'm aware of it. There's been a recent book published about that, in fact using the word "fraud," but let me say, from my own

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perspective I think this is going down a -- this has nothing -- an approach we wouldn't take. We don't subscribe to it. I don't subscribe to it. I don't know who he wrote this to, why he wrote this document. We wouldn't do anything like this today, and I don't know the context, I don't know the environment. What year was this?

MR. COFER: Have you actually read the document?

THE WITNESS: No, I haven't read the document.

Q I don't think it's dated on here, on the actual document.

A Is it an official Philip Morris document?

Q Well, it's at their website, so I don't know. It's got his name at the bottom of it. Let me ask you a couple of more questions, then.

MR. COFER: I'd like to have a continuing objection about questions with respect to this document based on lack of foundation, please.

Q As you think about it as we sit here and talk about this, do you recall whether you may have seen this before?

A It doesn't come to me that I've seen this document before. I may have been read parts of it,

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but there is -- I think I would have remembered the title. I have no clear recollection of seeing that before.

Q Would it have been appropriate in your opinion at anytime after 1964 to recommend smoking to someone as having a positive medical benefit?

A To the extent I can put myself back 37 years, knowing what I know about smoking today, clearly not. There were Surgeon General's Reports that actually had sections on the benefits of smoking post '64, but I don't believe any person today or in the recent past would do such a thing.

Q Are you familiar with any analysis which has been done by any medical or scientific group conducting a risk-benefit analysis from smoking that have concluded that the benefits of smoking would outweigh the risks?

A Absolutely not.

Q Have you ever discussed the smoking health issue with Mr. Goldsmith?

A Yes.

Q How recently?

A When Mr. Myles was chairman of Philip Morris, there was a meeting in Richmond, which Mr. Goldsmith attended, so that would be early '90's.

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That's my point of reference.

Q Did Mr. Goldsmith indicate to you whether by the 1990's he had accepted smoking as a cause of lung cancer?

A That was not the nature of our discussion.

Q You also indicated, I believe, that you might be testifying about the work of the Tobacco Working Group.

A Yes.

Q Were you ever directly involved in that?

A No, sir.

Q What time period did the Tobacco Working Group operate?

A From the early '70's until it was stopped in the early '80's, '82, '81, something like that.

Q Do you know whether any U.S. tobacco company involved in that effort as a part of the Tobacco Working Group acknowledged during the time that the group was in operation that cigarette smoking was hazardous to health?

A I don't know.

Q Are you aware of any such acknowledgement?

A I'm not aware of any information that would allow me to answer that question.

Q I'm going to show you a document in the

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form of a telex dated June 14, 1976 from Alex Holtzman. Says "Attention: Paul Isenring." I'm not sure if I'm pronouncing that correct.

A I know Mr. Holtzman. I don't know the other gentleman.

Q Who is Mr. Holtzman?

A At one time he was general counsel for Philip Morris U.S.A. He's an attorney.

Q Let's have that marked and you take a look at it.

(Carchman Exhibit 12 is marked.)

Q Do you think it was scientifically accurate to say in June of 1976 "There is no satisfactory evidence of harmful effects from cigarettes presently on the market"?

A No.

Q Would you characterize that as a misleading statement?

A Well, I don't know if it's -- I don't know who Mr. Isenring is, whether he's a scientist. Is Mr. Holtzman writing Mr. Isenring?

Q I'm assuming. This appears to be a telex from Mr. Holtzman to Mr. -- it says "Attention: Paul

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Isenring."

A I don't know who Mr. Isenring is. If Mr. Isenring is a scientist knowledgable in this area, then he would probably know precisely what Mr. Holtzman is talking about. Nevertheless, I think both Dr. Gori, who they're referring to in here, as well as Mr. Holtzman, are incorrect, scientifically incorrect, both of them. So misleading, I mean, there's an issue of intent. I have no way to judge that.

Q. Have you reviewed documents relating to the work of the Tobacco Working Group from other asbestos manufacturers -- I'm sorry, tobacco manufacturers who wrote letters or memorandums similar in content to that of Mr. Holtzman, to the effect that they did not accept the premise that any cigarettes currently on the market were unsafe or hazardous?

MR. COFER: Could you read that question back, because I kind of had trouble following it.

(Court reporter reads back previous question.)

MR. COFER: Object to the form.

You may answer.

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A The only things I've read with regard to the Tobacco Working Group were two things: Were all the reports and the article published in *Science Magazine* by Gori in one of his columns. I have had no access nor have I sought information from other tobacco companies about what they have said or thought about.

Q You indicated you also thought Dr. Gori was incorrect in his concept.

A As expressed there, assuming they've got it right.

Q Are you familiar with the work Dr. Gori did, or the publication, I believe, Dr. Gori did about a so-called safe cigarette or one that would not produce --

A Yes.

Q I've forgotten how exactly I phrased it, but basically, if you don't smoke any more than this or smoke these very low-tar cigarettes, it would be, quote, safe?

A There were two points. One is it's really a question of threshold, is there a level of smoking in which there's no measurable risk; and Gori published that in that *Science* article. It was, I don't know, six cigarettes, seven cigarettes.

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A second, and that's the one that I'm dealing with here, he says it's all particulate matter or tar, and I would say scientifically that's not correct. There are constituents in the gas phase that were and continue to be viewed as things that at least that I'm aware of that Philip Morris is trying to eliminate or reduce, so -- that have adverse biological effects.

Q. Do you recall that Dr. Irving Selikoff was a member of the Tobacco Working Group?

A. That could be.

Q. Do you know whether Dr. Gori ever indicated in any publications that there were certain groups of people who should never smoke, including pregnant women and asbestos workers?

A. I don't remember reading that, but at least for the pregnant women it wouldn't surprise me. For the asbestos workers, at that point in time that probably wouldn't surprise me either; but I can't specifically cite you where he said it if he said it, but it wouldn't surprise me.

Q Do you know whether any of the tobacco manufacturers in their work with the Tobacco Working Group ever suggested that any cigarette that could be developed that would be less hazardous than those

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currently on the market would ever be -- or would ever be sufficiently safe for asbestos workers to smoke?

A Gosh, I don't remember ever reading anything like that.

Q We were talking a few minutes earlier, Dr. Carchman, about the multifilter cigarette with charcoal, and I believe in your reliance materials that you furnished to us, there was a document that's dated March 19, 1964. It says "From: Joseph Field, For: Philip Morris, Incorporated," and it says, "Philip Morris multifilter - Dramatic Advance in Charcoal Filter Cigarettes - Introduced in Lexington." Do you recall that document? You might have to take it out of there to get it marked or maybe make a copy, if we could do that.

A I have seen that. I gave this to you, yes.

Q Would you take a look at that announcement.

A (Reviewing document.)

Q My question to you is whether a fair reading of that document would indicate that that is the type of an implied health claim that's referred to in exhibit No. 7 that's titled "Market Potential

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of a Health Cigarette"?

A I think your question better be directed to a lawyer. An implied health claim, that is way out of the box for anything that I can deal with. If I looked at this, I am -- I can't look at this without removing myself from my past and looking at how would somebody who didn't know anything about this view what's going on. I'm the wrong person to ask this question.

Q What was your purpose in including that in your reliance material?

A This had to do in part with the fact that Philip Morris was trying to develop new types of cigarettes to try to address public health concerns about smoke constituents, and the multifilter was on attempt on our part to try to address some of the things that had been pointed out -- what year is this, '64 -- over the last five, five years or so, by people like Professor Wynder about things that needed to be done to cigarettes. That's why I had it in here. This was just another example of cigarette design modification, trying to move down this pathway.

Q Do you think a fair reading of that document suggests that that is a safer cigarette to

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smoke, one that has that charcoal filter?

A I hope not, but again, I'm the wrong person to ask. Would we do anything like this today? Absolutely not.

(Break taken; Carchman Exhibit 13 is marked.)

Q Dr. Carchman, in your deposition in the Felise case, you indicated that the overall relative risk from smoking was ten to 20. Do you recall that?

A I don't specifically recall saying it in Felise, but it wouldn't surprise me if I did.

Q Would you agree that that's a correct --

A For smoking and lung cancer, I would say that's correct.

Q And you said there is an inverse relationship between socioeconomic status and risk for lung cancer.

A That's correct.

Q Would you agree the literature indicates that the more education a person has, the less likely they are to smoke?

A That's true as well.

Q And the more likely they are to quit smoking?

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A The data suggests that as well.

Q You indicated that for blue collar workers, the risk may be twice as great.

A Twice as great as?

Q That's what I wanted to ask you.

A Yes. Not specifically remembering what the series of questions are and because of the relationship, the inverse relationship, between socioeconomic status, and if you look at in general blue collar workers, their socioeconomic status is, say, less than most white collar workers, in a number of articles -- one comes to mind, I think a review by Trichoupolis and Dockery in cancer causes, Demetrius Trichoupolis at Harvard and Dockery also at Harvard, basically showed a doubling of the relative risk based on socioeconomic status. I think that's what I was referring to.

(Discussion off the record.)

Q So what you're saying is in general for blue collar workers, their risk tends to be about twice as great as for white collar workers?

A In general.

Q For lung cancer from smoking we're talking

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about.

A In general.

Q Do you agree that the literature would indicate that blue collar workers tend to start smoking at an earlier age than white collar workers?

A Putting aside racial and ethnic --

Q Just blue collar in general.

A I would say that the data tends to suggest that.

Q And they tend to be less likely to quit smoking.

A As well.

Q Do you intend to testify about any aspect of marketing cigarettes?

A Gosh, I hope not.

Q Do you know whether Philip Morris has conducted any specific scientific investigations on the health effects of menthol in cigarettes?

A I want to say yes, if we understand -- come to an agreement about a study on health effects. Philip Morris scientists conducted a review of the relationship of menthol in cigarettes and health issues. They did what's called a risk assessment.

Q And when was that done?

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A A year ago or so.
Q Prior to that time, you are not aware of any investigation of that issue?
A No, that's not true. As part of my evaluation of the smoking and health literature, I looked at what had been published and reviewed in the literature on menthol and smoking, both using, say, the '98 Surgeon General's report and some other data and some individual studies that were published.
Q When did you do that?
A Several years ago. It was part of an ongoing review that I started in '94, '95.
Q Prior to that were you aware of anything?
A I think a Philip Morris consultant had been looking at this as part of a regular review for the company on smoking and health, and I think menthol came up because it was part of what was being published.
Q And who was that?
A Peter Lee.
Q And he was an outside consultant?
A Yes, sir.
Q Has he published anything on menthol and smoking?
A I think this paper we were talking about

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several hours earlier on low tar has a component of that that deals with menthol.

Q Now, let's be specific about that paper. Now, which one are you referring to?

A There is a paper that Peter Lee has written, where he has reviewed the epidemiological literature on cigarette modifications, primarily filter, non-filter, high tar, low tar, but he's also looked at dark tobacco, he's looked at hand-rolled tobacco versus manufactured cigarettes, and menthol is a component of that.

Q For the purpose of publishing a scientific article?

A Yes, sir.

Q Now I'm asking, has any employee of Philip Morris, prior to the last year or so that you initially described in your testimony a minute ago, conducted any specific analysis of the health effects of menthol in cigarettes?

A I think the answer is yes, from this perspective: The menthol that Philip Morris uses in its mentholated products are evaluated by the Product Integrity Group within Philip Morris, so whether it's natural or synthetic menthol, who the vendor is we buy it from, the quality, the specifications and the

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chemical -- and the chemical analyses.

In addition, many years ago there was a National Cancer Institute -- there was a study published by scientists at the National Cancer Institute in which they took menthol and put in it a glass tube, evacuated the tube, and then heated it up, and in that paper they showed that they generated some other compounds, some of which would be unacceptable.

Dr. Jim Charles and others at the time in R&D did independent investigation -- I think those results are in Central File. I think I remember seeing them -- basically showing that if you put something in a closed chamber and evacuate it and heat it, it in no way represents what's going on in a cigarette. Menthol basically transfers through the cigarette rod unchanged, and you don't see the things Schaltzhauer (ph.) -- he's one of the authors on that paper.

So there were investigations going on looking -- reflecting on things that had been published about menthol and in terms of evaluating the quality of the menthol and the nature of the menthol the company was buying or considering buying for use in its mentholated products. I think that's

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all that I'm aware of.

Q Are you aware of anything that was done on menthol in cigarettes and the health effects of menthol in cigarettes in the 1970's by Philip Morris?

A Other than what I've just told you, I think --

Q Was that in the 1970's?

A I can't be certain of the dates. We'd have to -- I'd have to go back and look to see when that NCI paper was published. The quality assessment of menthol was going on long before I came to the company. How far back it went, I don't know.

Q Do you know of any published literature sponsored by Philip Morris on menthol in cigarettes and the health effects of menthol in cigarettes?

A The only one that would come close is this Peter Lee article that has as an element of the evaluation of human epidemiological studies the consideration of whether menthol has any contribution to the lung cancer risk, comparing smokers of mentholated cigarettes with smokers of non-mentholated cigarettes.

Q And when was that published?

A It's going to be published this year.

Q So it's not yet in publication?

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A That's correct.

Q Do you know whether the CTR ever investigated that issue?

A I am the absolute wrong person to ask about CTR. They may have. I have no idea.

Q To save time about questions regarding CTR, essentially you don't know anything about what they did or what investigations they undertook?

A I know part of what they did in terms of their external research because some of the members of their board were some colleagues of mine when I was at the medical school, before I came to Philip Morris, and I read some of the publications that were published that had attribution based on part or in whole funding from the Council of Tobacco Research. But other than knowing a few of the members of the board and some of the publications, I knew nothing else except that Philip Morris' contributions, financial contributions, to CTR came through the head of R&D. That was a budget item in the Research and Development budget.

Q But you don't know of anything, as we sit here today, that CTR did with regard to investigating menthol in cigarettes?

A No, I don't.

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Q Do you know whether Philip Morris attempted to develop any information as to whether smokers of menthol products perceived them as having health benefits?

A I am not aware of any studies directed in that manner.

Q Are you aware of any literature indicating that smokers did perceive menthol as safer cigarettes?

A Probably the easiest place was the '98 Surgeon General's Report. They have some discussion of that.

Q Do you know whether Philip Morris ever considered undertaking a study of the health effects of cigarette smoking among African Americans?

A In the past?

Q Yes.

A Not that I'm aware of.

Q Do you know whether any other tobacco company had done so?

A I don't know.

Q Do you know whether the CTR ever sponsored any such research?

A I have no knowledge.

Q Do you know whether the Tobacco Working

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Group ever sponsored any such research?

A Not that I'm aware of.

Q Do you know of anyone within Philip Morris who ever suggested that research should be undertaken with respect to African Americans and the health effects of cigarette smoking?

A Oh, sure, and some of that has been translated into the efforts we're undertaking with the total exposure study and with our interest in our external research program.

Q This is in the last year or so?

A Yes, sir.

Q Prior to that time.

A Not that I'm aware of.

Q Do you agree that the lung cancer incidence rates among African American males are approximately 50-percent higher than among Caucasian males?

A That's what's been reported in the Surgeon General's Report and in the literature.

Q And you would agree that that's accurate?

A I believe it's accurate.

Q And would you agree that that has been largely attributed to the differences in cigarette smoking habits between African American males and

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Caucasian males?

A I wish people knew why there was that difference. In the '98 Surgeon General's Report, I believe they raised two very important issues with regard to smoking amongst African Americans, and one has to do with culture, and the other has to do with socioeconomics; and they think both of those are playing a major role in what's going on here, because this incidence difference we're talking about in African American males you don't see in African American females compared to Caucasian females, which are pretty much the same.

And if it were true, that it's the smoking habit, then I believe it would be reflected in cardiovascular disease and in non-cancer pulmonary diseases, like COPD, bronchitis and emphysema. As far as I can remember from the numbers, there's no difference in cardiovascular disease. And for COPD, emphysema and bronchitis, it's the reverse; whites are at greater risk than African Americans.

So it's very, very complex. I mean, it would be wonderful to know the answer to that question, but if you just look at one thing and forget about all the other smoking-related diseases, you could walk away with part of that impression; but

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looking at the slightly bigger view, I would say that is -- you make that conclusion at your own risk. I don't think the data supports that.

Q Let me show you a document dated August 23, 1973, from R. Fagan to H. Wakeham, and it's Re: Sommers' Suggestions, and I'll ask you if you have seen that document before.

MR. COFER: Did you want to mark that as an exhibit?

MR. FORMAN: Yes.

(Carchman Exhibit 14 is marked.)

A I've never seen this before. I don't remember seeing this before.

(Off the record.)

Q As you sit here today, you don't recall having seen this document before?

A I don't recall.

Q Do you not recall being shown this document during the Felise trial?

A I may have been. I was shown so many documents.

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Q Now, in reviewing the document, did you note that "Special groups are mentioned as worth study. These include women and blacks. A prospective study on these two population groups should be expanded to include immigrants as well as other minority groups"? Did you see that?

A I did see that.

Q Would it be fair to state that so far as you know, there was never any follow-up by Philip Morris to undertake a prospective study, as suggested in this document?

A I'm not sure whether he's talking about stuff that other people were doing and/or stuff that we should be doing. I can tell you that I'm not aware of any epidemiological studies that we have -- we have actually done. We have sponsored and are sponsoring epidemiological studies, but in terms of immigrants, not that I'm aware of. In terms of pregnant women, nothing that I can recall.

Q And in terms of blacks or African Americans?

A Not that I can recall.

Q Do you agree, Dr. Carchman, that lung cancer risk in African Americans is higher than for Caucasians for a given level of smoking?

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A Are we talking about overall?

Q Yes.

A I don't remember. I don't believe that was the conclusion of the '98 Surgeon General's Report, but I don't specifically remember that. Nothing in my mind stands out to say that that's correct.

Q Do you recognize this document: "Tobacco Use Among U.S. Racial/Ethnic Minority Groups"?

A '98 Surgeon General's Report.

Q I'm going to show you a reference on Page 138 of the document, and I'll ask you if the Surgeon General reports here, "Because nearly all cases of lung cancer are attributable to cigarette smoking, variations in lung cancer patterns between racial/ethnic groups most likely reflect differences in smoking patterns."

A (Reviewing document.) I think I have the same highlights in my copy as well. That was a summary statement you read.

From the same report, Page 140, Chapter 3, "One study, Harris, et al., 1993, showed a higher lung cancer risk among African Americans compared with whites who had the same level of a cumulative exposure to cigarette smoke," okay? "Then in a much

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larger study, a 20-year case-control study, African American women, after adjusting the data for a cumulative tar consumption and education, the researchers found that African Americans had a significantly higher risk of lung" -- one limitation of the study, that it uses the Federal Trade Commissions estimates of tar yield, and they basically go on to say that that's not a reliable way of knowing how much anybody smoked.

Then in another citation on Page 141, Schwartz and Swanson, a more recent paper, 1997, and this is participating in the NCI SEER program, which represents about 10 percent of the United States' population: "The analyses were stratified by gender, statistically adjusted for age, education, cigarette smoking behaviors. The overall risks of lung cancer of all histological types were similar for African Americans and whites. Thus race did not appear to be an independent predictor of lung cancer in the population as a whole."

I think that looking at a summary statement and trying to make a generalization without understanding the elements that go into it -- they have reported all of the elements. For whatever reason they basically decided to focus in on that,

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but the citations of the studies that they quote in here I don't think -- if you want to ignore things that don't fit into your notion, you do so at your own peril.

Q Do you agree that the SEER data show that African American men have had consistently higher lung cancer incidence rates than white men since the 1970's?

A Yes, sir.

Q Do you agree that between 1950 and 1960, age-adjusted death rates from malignant neoplasms of the respiratory system composed primarily of deaths from lung cancer among African American men surpassed those among whites men and have since remained higher?

A I agree.

Q Do you agree that for persons born after 1915 peak smoking rates and duration of smoking for African American men were slightly higher than those for white men?

A That's what the data says. That's what's in the '98 report, yes.

Q "African American male cohorts born after 1915 experienced a greater cumulative exposure to cigarette smoke."

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A There is no objective data to support that. That's based on asking somebody whether they smoke and how much they smoke and how long they've smoked. There's no way of getting at how much they're exposed to.

Q Do you agree that the literature indicates that African American males -- a higher percentage of African American males are smokers than white males?

A The smoking prevalence.

Q Yes.

A Historically -- everything is going down, but historically they were higher, yes.

Q Did the Surgeon General report that the combination of less cessation -- let me go back and ask you that first. Do you agree the literature would indicate that African American males are less likely to quit smoking than white males?

A Historically that's been true.

Q "The combination of less cessation, higher peak prevalence and longer duration of smoking in African American men after the 1940's likely explains the observation that mortality rates for African American men began to exceed those for white men later in the century."

A I agree with parts and don't agree with

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other parts. The part I agree with is that the smoking duration and the fact that they actually start generally at an earlier age are probably the more important of the elements you've mentioned. If one looks at incidence, I would say all of what you said is true, but you used the word "mortality." And it's very clear that with regard to minorities, particularly African Americans, mortality, whether it's lung cancer or other serious diseases, as it relates to minorities has more to do with socioeconomic status, cultural issues, and as a recent JAMA article pointed out, with some -- other differences may be racial bias differences in terms of medical care.

So if you're talking about lung cancer incidence, I pretty much agree with you with the qualification about duration. If you're talking about mortality, I think there are other much more important issues here.

Q Would you agree that over 90 percent of people who contract lung cancer die from lung cancer?

A Yes.

Q So even though we could agree the access to medical care and the quality of medical care has been different for African Americans and whites, that

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wouldn't affect the incidence of lung cancer, would it?

A That's what I'm saying; we agree on that.

Q Now, would you further agree with this statement at Page 143 of the Surgeon General Report from 1998: "In summary, higher rates of lung cancer observed among African American men are consistent with historical patterns of cigarette smoke in this century"?

A If by cigarette smoking patterns we're talking about the number of cigarettes smoked, the age of smoking initiation and the duration of smoking, yes.

Q "In addition, African American men age 40 to 54 years may be especially susceptible to lung carcinogens," it says, "perhaps because they detoxify them differently."

A Further on in this report, they mention that this is an area for research. You used the word "may." This is a hypothesis. We are very much interested in this to see if African Americans do represent a susceptible population. And I think this whole area, both the '98 Surgeon General's Report, the IOM report, and if you look in the latest issue -- and it's not in my reliance documents

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because I just got the article the other day, in the *International Journal of Epidemiology*, Page 111, Crookshank & Company looked at Africans, asking the question about genes, population and disease and basically concluded that nobody really knows why African Americans, which are only a few generations removed from their roots in sub-Sahara Africa, have such different disease patterns. And they think it has more to do with lifestyle characteristics than it does with genes.

But nevertheless, in that report and in this article, it's an open question whether there are polymorphic differences. In that report they go on to point out that these polymorphisms, these allele changes, are so rare that nobody really knows whether this is important or not. I think it's a reasonable area to raise as a concern, but to draw it as a firm conclusion as to why these observations are there, I think are scientifically clearly premature.

(Break taken.)

Q Dr. Carchman, we earlier discussed the fact that the incidence of lung cancer among African American men is approximately 50-percent greater than

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among white men. What proportion of that difference do you attribute to cigarette smoking?

MR. COFER: Object to the form.

A There's a higher smoking prevalence, though more African Americans are listed as occasional smokers, maybe what are called "chippers," non-addicted, non-dependent. I want to say the difference is related primarily to smoking, but maybe I'm not understanding your question.

Q Do you agree that African Americans tend to smoke menthol cigarettes?

A Yes.

Q That approximately 75 to 90 percent of African American smokers smoke menthol cigarettes?

A Is it that high? Yeah, I thought it was maybe 60, 65 percent.

Q Do you agree that some reports have indicated that there's a higher lung cancer risk reported for menthol cigarettes?

A And some have not, yes.

Q There's a conflict on that?

A Yes.

Q To what extent has Philip Morris sponsored specific studies of that issue?

A The risk assessment that was done on

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menthol included that and relied upon the individual studies, the epi studies in humans that had been published that had a menthol component, Sydney & Company and some other people, but also relied on Sydney, one of the authors of one of the major papers, I think a European study, but also relied on the '98 Surgeon General's Report and relied on a meta-analysis of the menthol studies that was done by Peter Lee.

Q And that's all within the last couple of years?

A That's correct.

Q Do you agree that African Americans tend to smoke higher tar and nicotine cigarettes?

A I think that's what the data suggests, yes.

Q Do you agree that it's been recently shown that African Americans have decreased cotinine clearance?

A I think if you're talking about the Benowitz studies -- it's interesting. They report on a study of 12 individuals, I think, in there, and then reflect upon an entire population of 30 million individuals based on 12. It's clear that apparently in -- apparently, in general African Americans have

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higher cotinine levels. I think Dr. Benowitz has also shown that in terms of pharmacokinetics, uptake absorption distribution, there is no difference between the two, and I think the Surgeon General recommends in there additional studies with larger populations to try to clarify this question.

Q Now, for the benefit of explaining this further, what is cotinine?

A Cotinine is the major proximate metabolite of nicotine.

Q So when nicotine is inhaled, it's metabolized in the body and it's excreted as cotinine?

A No.

Q Explain that.

A When nicotine is taken into the body by any route, whether it's nicotine gum, nicotine patch or nicotine inhaler or through a cigarette, it's metabolized in a number of places in the body. A major place is the liver.

And, oh, I don't know, there must be a dozen or so metabolites of nicotine that are produced, and it is generally excreted in the urine, and cotinine is not the major -- the major metabolite that is excreted. Trans 3 hydroxy cotinine is

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probably the major -- the major metabolite, but since there are such tremendous variations in nicotine metabolism within an individual and between individuals at different times, the only real way of understanding what's going on with nicotine metabolism in anyone, African American or Caucasian, is to look at a panel of nicotine metabolites and capture 95 percent of the mass balance.

Looking just at cotinine, you can get anywhere from ten to 30 percent, and if you only take one measurement, which is generally what's been done, there's no accurate way of knowing whether any individual -- and I think that's pretty impossible; the best you can do is in populations -- have increased, decreased or no difference in nicotine uptake and/or metabolism, which I think is one of the reasons why the Surgeon General in the report makes a recommendation for additional work in this area.

Q Does the Surgeon General Report that "Evidence suggests that African Americans have higher cotinine levels per reported number of cigarettes smoked per day than whites"?

A The key word is "suggest," but they also go into all of the things that I just discussed in the body of the report, which is why they basically

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say we need to do some more work in this area.

Q At Page 185 of the 1998 Surgeon General Report, it stated "African Americans currently bear the greatest health burden." Do you agree with that?

A Not simply related to smoking. I think in general I think that's true. For many chronic diseases that are either smoking related or not smoking related, I think that's true.

Q And then it says "Differences in the magnitude of disease risk are directly related to differences in patterns of smoking."

MR. COFER: May he see what you're reading from.

A That could very well be true. We've talked about that before.

Q Do you know whether Philip Morris has ever undertaken any effort to advise African Americans they may be at greater risk of disease from smoking than whites?

A Well, only with respect -- specifically Philip Morris?

Q Yes.

A Beyond what is mandated on the warning label?

Q Yes.

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A No.

Q Do you know whether there's been any discussion --

A Yes.

Q -- of doing that?

A Not just for African Americans. There's been significant discussion over the years about what to do with this, and it actually sort of spins back to the asbestos question. As you probably know better than I, the government had all this information about smoking, asbestos workers and the risk for lung cancer; and actually, I think, at least in one part of the world, there are -- there are or were very specific warning labels targeted at asbestos workers. The government decided not to do that for whatever reasons, and I have my own speculations, but the scientists within R&D have talked about this.

To pick out a select group basically -- this is speculation on my part and some of my colleagues -- could leave the door open to say, Well, I'm not an asbestos worker, I'm not a African American, I'm not a pregnant woman. Somehow I have a better chance of not getting some disease; and I suspect -- it's only a suspicion on my part -- was

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one of the reasons why the U.S. government decided only to, through, say, OSHA bulletins notify people about -- who were targeted as asbestos workers and smokers that you all may be at a special risk, but not to change the warning label.

The warning labels are very simple, very direct and very clear. They give very little room for a non-scientist smoker to be confused about the risks of the -- the risks of the product.

Q With respect to that rotational warning issue that you raised, was that in 1981 --

A Yes, I think so.

Q -- in connection with the work that was done in Sweden?

A I believe -- I know it was a Scandinavian country that had that.

Q Did the Federal Trade Commission, when they investigated that issue, recommend that the U. S. adopt the rotational warning?

A Again, I don't know.

Q You appeared as a witness in the Butler trial in Mississippi in 1999?

A I was in Butler in Mississippi. If you say it was '99, that's probably correct.

Q Do you recall testifying there that

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Dr. Selikoff had shown in a study in the 1990's that the relative risk of developing lung cancer from asbestos was 3.75?

A I don't specifically recall that.

Q Would that be in accord with your understanding?

A In the 1990's?

Q Yes.

MR. COFER: Do you have the testimony?

MR. FORMAN: Yes.

Q I'm going to hand you testimony of Dr. Carchman from the Butler trial dated -- appears to be dated May 27, 1999 at Page 3650.

A (Reading.)

Q Do you recall giving is that testimony?

A I don't recall, but some of these elements in terms of family history and the relative risk, I mean, I know those numbers, and for the high-fat diet I know the number. The asbestos number, if I said it, I said it. Where that came from -- you know, it says "Selikoff in the '90's," which is sort of amazing. But this is uncorrected testimony. I mean, unlike a deposition, where I have a chance to review it. So if you look above, where it says "The relative risk for developing lung certificate is

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about 1.7," I mean, I don't believe I said "developing lung certificate."

Q Do you have a reason to believe now that you didn't say the risk from asbestos was 3.75?

A I don't know why I said 3.75.

Q Do you know what the nature of Mr. Butler's exposure to asbestos was?

A I don't remember.

Q Do you know whether he had a history of working as an insulation worker?

A Well, whatever information I have here was related to me, and so he obviously had some history of exposure. Secondly, he had an exposure to asbestos.

MR. COFER: I can clear that up if you want to go off the record.

(Discussion off the record.)

Q Now, you have seen a report from Dr. Wakeham dated in March of 1968, in which he comments on asbestos workers and smoking?

A Whether I've seen that one -- I have seen a document with Dr. Wakeham's name on it touching on asbestos. Whether it's that one or not, I'd have to

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take a look at to see.

MR. FORMAN: Let me have this marked as the next exhibit.

(Carchman Exhibit 16 is marked.)

Q. Does that document look familiar to you?

A. Yeah, I think I've seen -- I know I've seen parts of this document.

Q. If you'll turn to Page 4, I believe there's a reference to asbestos workers at the top. It's either Page 3 or 4, I think. It is kind of hard to read this document, but starting at the bottom of Page 3 and the top of Page 4, there's a reference to "A review of epidemiological evidence relating human ailments to environmental and behavioral factors with the aim of revealing other areas which can be investigated to find out what extent human ailments are really due to smoking and what are due to other causes. An outgrowth of this study might be an attempt to define in some manner those elements of the population who, like asbestos industry workers, are more likely to encounter serious risk by smoking and who, therefore, should be discouraged from indulging in the habit." You've discussed this

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before?

A Yes.

Q Now, are you aware of any tobacco company undertaking any effort to discourage asbestos workers from smoking?

A I have no knowledge one way or another.

Q Do you know whether that subject was ever further discussed at Philip Morris after this document dated March of 1968 from Mr. Wakeham?

A Not that I'm aware of.

Q Who would make a decision like that if there were to be an undertaking to discourage asbestos workers from smoking?

A It wouldn't be anybody in Research and Development. I mean, things may start -- something like that may start there, but the final decision would come from higher up in the organization.

Q Well, this letter was sent to Mr. Goldsmith, I believe. He would be someone --

A Oh, yes.

Q -- who could make a decision like this?

A Who could rattle somebody's cage to do it, yes.

Q Have you asked him about that in any of your conversations with him?

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A Well, I've only had one conversation with him, and it was not about asbestos and smoking.

Q Do you agree that the risk of lung cancer from asbestos exposure varies according to the level and duration of exposure?

A That's -- I think that's consistent with the data that's out there, except that very few, if any, studies actually measure the level of exposure. It's sort of based on job description. And if there are studies that measure levels of exposure, they just measure dust. There are even smaller number of studies that have actually measured the particles. And there is usually more than one type of asbestos involved, so it's very, very difficult to just clearly point your finger and be able to answer this concisely as that. But generally speaking, based on the epidemiological data, that's what it tends to suggest.

Q You have referred in the past to an article by Goodman, a 1999 article, I believe.

A Which one?

Q I'm trying to find a copy of it.

A Oh, a review?

Q Yes, the meta-analysis; do you recall?

A One of the meta-analyses.

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(Off the record.)

Q Do you recall how you happened to come across the Goodman article?

A Not specifically.

Q Do you recall what the conclusion of the article was -- and I apologize, I can't find my copy of it now -- with regard to the overall risk to asbestos workers?

A I'd have to look at it.

Q You also indicated in your report that you would be testifying about nicotine analogs and the Nicotine Analog Program.

A Yes, sir.

Q What is the nature of the testimony that you expect to give about that?

A It would depend on the nature of the questions asked to me about that program. I don't know if Mr. Cofer will ask me on direct anything about that, but if you were to ask me a question, something that I knew something about in that program, I would respond.

Q What is a nicotine analog?

A In the context of Philip Morris' program,

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it was a compound whose base structure was related to nicotine that had a chemical modification, either a bond, a chemical bond in a different place, or an addition of a group, whether it was a small group or a large group; but these were derivatives, analogs of nicotine, that Philip Morris organic chemists synthesized themselves, made themselves.

Q And was the general purpose of the program to look for a reinforcing agent for smoking?

A No, the objectives were clearly stated in the Philip Morris documents. They were looking for a compound that had central nervous system activity like nicotine, but had no peripheral cardiovascular activity like nicotine. They were looking to separate the two. That was the stated objective in the mission purpose, if you will.

Q Now, the central nervous system activity as you described, what was it specifically that Philip Morris was interested in in that issue?

A You know, that's a question I keep asking -- I keep asking myself to this day. I can only tell you by inference in terms of what tests Philip Morris either conducted or had other people conduct in this -- in this area. So in terms of the central effects of nicotine, Philip Morris had

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Dr. Leo Abood, since deceased, University of Rochester, one of the fathers of the development of the nicotine receptor assay, doing nicotine receptor work on materials including the brain, and also our institute in Germany was also doing studies on nicotine receptors. Dr. DeNoble's laboratory in Philip Morris was doing what would generally be called behavioral pharmacology with these compounds. Excuse me, Dr. Abood also did prostration assays, which is also another way of looking at some generalized phenomena in terms of the central nervous system.

So in that regard, those were the activities they were looking at. And so Dr. DeNoble's laboratory I think tested all of the analogs, Dr. Abood tested some, Inbifo tested all -- the Institute tested all of the analogs. The Institute also did guinea pig ileum work, which is a standard pharmacological assay. And Dr. Jack Eagle, at the Medical College of Virginia, who it turns out was my neighbor in the laboratory -- we shared -- our offices were right next to each other, he had a contract with Philip Morris to look at the effects of these nicotine analogs on blood pressure in the rat in a standard cardiovascular assay.

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So they had what I would call elements of some central effects and then some peripheral effects, the guinea pig ileum, being a general peripheral effect, whereas the cardiovascular/blood pressure was spun on for the kind of things they wanted to develop an analogue that didn't, that the analog would have no effect on blood pressure the way nicotine does and would have some effect in terms of receptor binding to brain material from animals and then some effect in some of the behavioral assays that Dr. DeNoble's lab was looking at. So they were trying to separate these with the analogs they had. And that's what the program -- the key elements of the program were about.

Q Were they looking for a way to reinforce smoking and to make it more desirable to smokers?

A That was never specifically stated, and when I -- when you look at the documents, what they were talking about was if they were to find something that had central nervous system activity, whatever that was, okay, and there was no clear idea from the documents from speaking to the people that were in the program what that would be, and had little or no cardiovascular activity, the idea was to remove the nicotine from the tobacco and then put this analog in

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and test it in prototypes. That was the idea.

Q Looking again at the Institute of Medicine report that's been previously marked as Exhibit 6 at Page 9-9, do you agree with this statement: "Although tobacco products contain several thousand chemicals, nicotine is considered to be the principal constituent in tobacco that leads to persistent use of tobacco products"?

A You've asked me this question before, several hours ago, and I think my answer then is the same answer I have now. I think nicotine is an important component of smoking. Is it the primary reason people smoke? I don't think so.

Q Was the Nicotine Analog Program terminated in 1984?

A Yes.

Q Was it terminated due to legal considerations?

A I have seen at least one memo from one lawyer to another to that effect. I have also -- one of my first assignments when I came to the company was to review the Nicotine Analog Program, and I've done it two or three times; and my conclusion was they had synthesized all these analogs, they had done all of these tests, and they failed to identify a

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single analog that met the objectives. So the program was complete. It failed to achieve the objectives.

So from a scientific perspective, it didn't make any sense, since there were no more analogs to test, to do any more testing on; but I have seen the Sirridge-to-Newman memo raising some concerns about Philip Morris doing this kind of work, but this was before I got there. I was not involved in that. My only level of evaluation is scientific. They did the work. They failed to identify a compound that met the objectives. There was no reason to continue.

Q Let me show you what --let's mark as the next exhibit. It's called "Philip Morris Behavioral Research Program."

(Carchman Exhibit 15 is marked.)

Q Have you seen that document before?

A I think I've seen parts of this document.

(Discussion off the record.)

MR. JONES: With respect to the exhibit

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that you just handed the witness and the one prior to that, I believe both of them are Bliley documents or what's been referred to in the case generically as Bliley documents. We continue to assert the privilege, and I do think that there is an order, but I can be corrected on this, which restricts the interrogation of the documents to the four corners of the document.

MR. FORMAN: Let me ask you this, Bill: I'm not sure when you say "the prior document" which one you're talking about.

MR. COFER: Well, there wasn't a document, per se. Dr. Carchman referred to the Sirridge document, but it was not actually marked as an exhibit or used.

Sorry for the interruption. I didn't know the status. I wanted to make sure we preserved whatever record needed to be preserved.

Q Let me also have marked the next document that says -- I think the title of it is "Philip Morris Research on Nicotine Pharmacology and Human Smoking Behavior," dated April 6, 1994. We'll mark that as No. 16.

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(Discussion off the record.)

MR. FORMAN: Make it 17.

(Carchman Exhibit 17 is marked.)

Q Have you seen that document before?

A I don't think so, but I may have.

MR. COFER: Mr. Forman, would it be acceptable, rather than interrupt each time with respect to a so-called Bliley document, just to say that we want to continue --

MR. FORMAN: Sure.

MR. COFER: -- to assert the privilege for purposes of this deposition. I won't interrupt the examination.

MR. FORMAN: Sure.

MR. COFER: Thank you.

A I want to say I don't think so. I don't think I've seen this before.

Q I'm going to go back for a minute to Exhibit 15 that's titled "Philip Morris Behavioral Research Program," and I'll ask you if this document doesn't reflect on Page 17 that in the "Spring 1984, DeNoble was terminated and the Nicotine Program was

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discontinued. Although there were no internal documents found stating the reasons why DeNoble and his programs were terminated, it could be easily concluded that the unfavorable analysis of the program submitted by Philip Morris' legal counsel prompted DeNoble's termination and the program's cancellation."

A I'm sure you read that correctly, yes.

MR. COFER: What was the question, counsel?

THE WITNESS: If the document indicated that that was the reason for the termination of the program that Dr. DeNoble was involved in, the Nicotine Analog Program.

A It said "it could be easily concluded." It doesn't say that it was.

Q All right. And just above that paragraph was the paragraph referring to the letter from Mr. Sirridge, which you briefly discussed, which contains the statement -- I'll ask you if this is true: "In the final analysis, the performing and publishing of nicotine-related research clearly seems ill-advised from a litigation point of view," and when you read that in conjunction with the paragraph you just read about the termination, that "it could

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be easily concluded that the unfavorable analysis of the program submitted by Philip Morris' legal counsel prompted DeNoble's termination and the program's cancellation," do you have any information indicating that's not correct?

A As far as I'm concerned, the cat was out of the bag. I mean, DeNoble had already published work from his laboratory at Philip Morris on nicotine. I would see him on a regular basis at the medical school presenting his data to a group of people interested in it. In fact, his work was cited by Jack Henningfield in a review sponsored by the National Institute on Drug Abuse. So this is 1984. Several years before at least they had already published in the open literature, and Dr. Jack Henningfield, who was at NIDA at the time, was well aware of the work. So I guess one could -- depending on one's level of imagination, one can construe anything one wants, but as I said, the cat was already out of the bag.

Q Now, did Dr. DeNoble investigate the combination of nicotine and acetaldehyde?

A I know he wanted to, and whether he actually did that or not, I don't recall.

Q Well, I'm going to again refer you to

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Exhibit 15. Looking at Page 22, does it refer to studies on acetaldehyde self-administration?

A I know he wanted to do it, but whether he actually did it or did it in a way to enable one to answer the question, I don't know. Yeah, I mean, these were objectives. Then they initiated -- they did acetaldehyde alone. I'm not aware of --

Q In the context of that document, when nicotine or acetaldehyde is referred to as a "reinforcing agent," what do you interpret that to mean?

A A reinforcing agent in behavioral pharmacology is some behavior that encourages the continued use or, in this case, administration of whatever that material is.

Q So that the inclusion of nicotine in cigarettes would tend to reinforce the users' continued use of cigarettes?

A Nicotine is viewed as a reinforcer, both as a primary reinforcer and as a secondary reinforcer as well.

Q Now, let me see the other document for just a moment there.

A This one?

Q Yes.

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MR. JONES: When you say that document, what number is that?

MR. FORMAN: That is No. 17.

Q I'm looking at Page 14 of Exhibit No. 17, and the statement is made that "Acetaldehyde was found to be a positive reinforcer without withdrawal effects." Do you recall Dr. DeNoble finding that?

A I believe I do.

Q And that "Nicotine slash acetaldehyde, [this research has never been published. There is nothing in the literature regarding the synergistic effects of nicotine and acetaldehyde. DeNoble believed that additional research on the nicotine/acetaldehyde synergy (sic.) may have shown that cigarettes were in fact addictive." Then there's -- are you familiar with that?

A Yes.

Q And then there is a reference to combining nicotine and acetaldehyde. And do you recall a reference to indicate that that combination was considered by Dr. DeNoble to be very, very powerful as a reinforcer?

A I think that was his hypothesis, but what's the date on that document?

Q April 6, 1994.

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A Yeah, I think -- again, I don't know where that document came from, but I think it's in error in basically saying there's nothing in the literature on the relationship of nicotine and acetaldehyde. There's a National-Institute-on-Drug-Abuse-sponsored meeting in which Dr. Ovid Pomulerau, from the University of Michigan, and his review basically provided an analysis that totally dismissed the synergistic interaction of acetaldehyde in nicotine. So I don't know who created that document, but clearly they were remiss in not catching that NIDA-sponsored symposium and the chapter by Dr. Ovid Pomulerau at Michigan.

Q Do you know a Frank Ryan?

A No. I know the name.

Q Is he a Philip Morris employee?

A I believe he was. He left, I believe, before I got there.

Q Now, would it be fair to state that some research has indicated that the reinforcing effects of the combination of nicotine and acetaldehyde are additive; some have said synergistic?

A What research?

Q Are you not familiar with any that has indicated that?

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A (Shakes head in the negative.)

Q I'm looking at Page 9 of the document. It says "Upon learning that acetaldehyde functions as a positive reinforcer, they endeavored," and this is the research that Dr. DeNoble has been involved in, "to study the combined effects of nicotine and acetaldehyde on self-administration. Results indicated that reinforcing effects of these agents were additive." Does that ring any bell with you?

A All I remember was that they didn't do anything to support their -- the data -- whatever data they got did not support their hypothesis.

Q It says "Research done by Frank Ryan indicated that acetaldehyde and nicotine data could be used to predict cigarette sales at a 96-percent accuracy." Are you familiar with that?

A I have heard that statement before.

Q Do you have any reason to indicate that it's not accurate?

A Sure.

Q He did not do that?

A No. That his conclusion is inaccurate?

Q No, that he did -- whether it was accurate or not, he did make what he thought was that finding.

A I have heard that. I have not seen his

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analysis.

Q To what extent did Philip Morris use acetaldehyde in any of its cigarettes?

THE WITNESS: I'm assuming this isn't proprietary information.

MR. COFER: Well, let's talk about that, then.

(Break taken; court reporter reads back previous question.)

A Many years ago acetaldehyde was one of the compounds that Philip Morris used as an ingredient. It then went to acetal for a short period of time, which release acetaldehyde, and then in the early '90's it stopped using -- they stopped using it all.

Q Was its purpose for inclusion as one of the ingredients as a reinforcing agents?

A No.

Q Was there knowledge that it acted as a reinforcing agent during the time that it was used?

A Not by the people who were using it. There may have been knowledge in DeNoble's laboratory. The levels that were -- the amount of material added was actually miniscule. The burning

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of tobacco itself, as found in cigarettes, generates a lot of acetaldehyde. Acetaldehyde is an aldehyde and it is by amount in cigarette smoke the major aldehyde found in cigarettes. So the addition of acetal, or acetaldehyde as Philip Morris used it, did not change in any measurable way the amount of acetaldehyde found in smoke, which was part of the reason why we stopped using it. Why use something that wasn't doing anything measurable from an analytical chemical perspective?

Q Are you familiar with the Federal Register publication by the Food and Drug Administration in August of 1995?

A Familiar might be that, yeah, I've heard people talk about it, but I don't think I've ever looked at it.

Q Referring to Page 296, let me read you this and see if you agree with it: "Philip Morris documents state explicitly that the purpose of the research on nicotine analogs was to find nicotine substitutes that were behaviorally active and had the same reinforcing properties as nicotine; i.e., produced effects on the central nervous system associated with addiction."

A As I stated, the objective, the written

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objective in the Philip Morris documents, were to find something that had the same central nervous system effects of nicotine without the peripheral cardiovascular effects.

Q Do you agree that nicotine in cigarettes is addictive?

A I think if you're asking me are there some people who smoke cigarettes because of nicotine, my answer is yes.

Q Well, do you agree that smoking is addictive period, unequivocally?

A As the term "addicted" is commonly used, yes.

Q And how long have you been of that opinion?

A I don't know. I can't tell you a date certain, you know, when I arrived at that conclusion. I know that as part of Philip Morris' activity in this area, there are a group of scientists within Philip Morris that have been tasked with keeping up in this area, and I have been asked to consult for the company with them in this particular topic; and one of their conclusions is that smoking is addictive, as the term is commonly used.

Q When you say, "as the term is commonly

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used," are you referring to the way it was defined by the Surgeon General in 1988?

A This is in -- I'm not sure. Part of it is and part of it isn't. To paraphrase it, smoking can be a repetitive behavior associated with an adverse outcome - disease, death - suggesting a loss of control. So I think those three elements are consistent with the overall elements of the Surgeon General and WHO.

Q Do you know whether any other tobacco company or any tobacco company at this date, year 2001, has not publicly admitted that smoking is addictive?

A I don't keep up with other tobacco companies' statements generally except what I read in the paper.

Q Are you aware of any claim by Dr. DeNoble that he found at least two nicotine analogs that met the criteria that would retain the physiological and behavioral effects of nicotine on the central nervous system, specifically nicotine's reinforcing qualities, but would not retain nicotine's adverse effect on the cardiovascular system?

A I am aware of those claims.

Q And are you aware that he made those

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claims in a statement that he gave to the Food and Drug Administration?

A I am aware. I'm aware of that, yes.

Q Do you know whether he's retracted those claims?

A Retracted them?

Q Yes.

A I have no idea.

Q You were never involved in any of the basic research on this, were you?

A That was going on before -- I got there really in '89, and the laboratory was closed in '84, so no.

Q I take it you disagree with his claim that he found at least two analogs like that.

A Disagree? I would say disagree is putting it mildly, since he was totally unaware of the Jack Eagle cardiovascular work, and he was basing his assumption on the information that Inbifo, our institute, had on guinea pig ileum. And there isn't a pharmacologist that I'm aware of that would extrapolate guinea pig ileum to the cardiovascular system.

A simple examination -- because I went over to Dr. Eagle's office, and I sat with him and

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went through the raw data as well as the summary reports. If Dr. DeNoble had seen or was aware of the cardiovascular data, there's no way he could have made that allegation, if you will; and to base that allegation on guinea pig ileum I think raises some serious questions about his fundamental knowledge of pharmacology.

Q Do you know where Dr. DeNoble is now?

A Not today, no.

Q Let me show you a document that's dated October 7, 1969, signed by Joseph Cullman, III, to Mr. Ross Millhiser. I'll ask if you are familiar with that.

MR. COFER: Do you want to mark that?

MR. FORMAN: Yes.

(Carchman Exhibit 18 is marked.)

A I don't know. I may have seen this one, but I have seen documents that touch upon this in this timeframe.

Q Do you know when Philip Morris, if ever, established a biological research program in the U. S.?

A Sure. It had biological research going on

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in Research and Development down the road from the '60's through the time I came here; and then in '94, something like that, it established Centers of Excellence, and all the biological research that Philip Morris was doing in-house went to the institute in Germany.

Q Let me look at that for just a second. Would you agree this document would indicate that as of October, 1969, the company had not established a biological program?

MR. COFER: May he look at the document, before he answers.

MR. FORMAN: Sure.

MR. COFER: Thank you.

A I don't read it as saying that.

Q You don't?

A No.

Q So is it your testimony that prior to that time, that is, October, 1969, Philip Morris did have an in-house biological program in the U. S.?

A It had biological research going on. I remember -- I don't remember the date -- some documents from Bob Carpenter in R&D talking about the research and collaborations in the area of biological research that Philip Morris was carrying out. I

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cannot swear it was 1969, but it was in that timeframe.

Q Do you know whether at anytime Philip Morris sponsored an epidemiology study of cigarette smokers?

A I think the answer is yes.

Q Yes, you know, or yes, they did?

A Both. Yes, I know, and yes, they did.

Q When did they do that?

A From at least post spring of 1988 through Center for Indoor Air Research, there were studies funded. Philip Morris was the major funding entity in that organization. There were epidemiological studies and analyses funded and published, and all of that is contained in a list provided by the Center for Indoor Air Research on an annual basis.

Q Was this an epidemiological study regarding secondhand smoke or exposure to secondhand smoke?

A Primarily.

Q Are you familiar with any epidemiology studies the company has ever sponsored on cigarette smokers, direct smoke?

A We currently have approved funding for several epidemiological studies in smokers.

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Q When did that funding become effective?

A Well, the proposals were reviewed and approved last month or so, and the funding should start May, May of this year.

Q Any prior to that time?

A Not that I'm aware of.

Q Did Philip Morris ever successfully market a cigarette without nicotine?

A Define successful.

Q One that they kept on the market.

A Not that I'm aware of.

Q Are you aware of any tobacco manufacturer that has ever succeeded in successfully marketing in that context, a cigarette without nicotine?

A I'm not aware of any product, including the one we tried to develop, that only or selectively just removed nicotine.

Q I'm looking again at the Institute of Medicine report at Page 1-6, "Experience with Next," are you familiar with Next?

A Yes, sir.

Q Is that a Philip Morris product?

A It was. Actually, the brand name is still in existence, and a product called Next is on the market, but it's not that.

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Q "A cigarette with extremely low nicotine levels that did not succeed in the marketplace." You would agree with that?

A Absolutely.

Q "Suggests that nicotine is one of the factors crucial to the success of a tobacco product." Would you agree with that?

A Absolutely.

Q Do you agree Philip Morris has the capacity to control the amount of nicotine in cigarettes?

A I would say superficially it might. The only way I'm aware of that it can really control the amount of nicotine would be by adding exogenous nicotine to the tobacco. Everything else in terms of blending gives you a way of sort of optimizing the tar-to-nicotine ratio, but that's just by blending technology.

Q Do you agree that "The pH strongly influences the concentration of free nicotine in tobacco smoke"?

A Not in commercial cigarettes.

Q I'm looking at Page 4-3 of the Institute of Medicine report. So you would disagree with that?

A Well, I need to see specifically what they

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are saying.

MR. COFER: Would you show it to him.

A Well, "The pH strongly influences the concentration of free nicotine in tobacco smoke." That's such a broad statement. All I said was that in the commercial marketplace, this doesn't happen. And that data was done for the Commonwealth of Massachusetts by Lab Stat in Canada, looking at the commercial marketplace in Massachusetts, and there's -- the smoke pH, okay, which is sort of an interesting concept in and of itself, varied in commercial products in the range of five to almost six. If you look at the -- the only thing that really makes scientific sense, in dilute aqueous solutions the so-called free nicotine, the uncharged nicotine, you're not really going to see until much higher pH's. You'd have to get up to the kinds of pH's, and I use pH in quotes, that you see in cigar smoke, which is eight, eight and a half, in which you would start to see this.

I would only point out that in 1988, in the U. S. Surgeon General's Report, this question of pH in commercial products, tobacco products, was addressed and found not to be -- not to be important.

In the laboratory, in an isolated

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situation, you can create tobacco smoke with very high pH. In the commercial marketplace it's in a very narrow band, and free nicotine, uncharged nicotine, is, I would say, a red herring.

Q Do you know who wrote this part of the report from the Institute of Medicine?

A No, but Dr. Benowitz, I think, was a reader at least. He wasn't on the committee, but he was used as a consultant by them, so I'm sure he's seen that.

Q Did Philip Morris ever use ammonia technology with respect to increasing deliveries of nicotine in cigarettes?

A Philip Morris has used ammonia technology for many, many years, not having anything to do with smoke pH, having to do with either making certain kinds of reconstituted tobacco or its use in very low levels as a -- as a flavorant.

MR. COFER: The question was whether Philip Morris ever used ammonia technology with respect to increasing deliveries of nicotine.

A The answer is no.

Q Going back to the asbestos issue for a minute, what is your opinion of the nature of the interaction between asbestos and cigarette smoking?

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There seems to be some dispute about the use of the term, quote, synergy, end quote, versus multiplicative.

A I don't have any issue with -- I understand those terms.

Q Would you use them interchangeably?

A In the context of this?

Q Yes.

A Only with providing specification as to what they mean and how they're being used. They are terms that you just can't use in a casual, casual manner.

Q Do you agree that the Surgeon General has often referred to the relationship between cigarette smoking and asbestos as synergistic?

A I have read that.

Q Would you disagree with that characterization?

A Well, since I don't know what the Surgeon General means by synergistic, I can't -- and nowhere in the Surgeon General's Report do they specify sufficiently to be able to answer that question. You know, it's too bad you couldn't find the Goodman Paper or some of the other reviews of that question, because it's scientifically a very, very interesting

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question. From a public health perspective, I think it's an absolute simple lay-down. The animal work on asbestos --

Q When you say "an absolute simple lay-down" --

A A lay-down; people who smoke who are jointly exposed to asbestos and tobacco smoke have an increased risk for lung cancer.

Q That is greater than from smoking alone?

A Or from asbestos; that's correct. The question you're asking me is a very technical question, is it synergistic, is there an interaction, and I have my opinion -- my scientific opinions on that based upon both the epidemiology, based upon some pathological data on human fiber burden and based on animal exposure study. But it's an intellectual exercise, but from a public health -- from a public health perspective, if you're jointly exposed you get more lung cancer.

Q In your opinion is it an additive risk or a multiplicative risk?

A I think "interaction" is a term that statisticians, epidemiologists, pharmacologists and toxicologists use in different ways. There is a wonderful chapter in the <u>New York Academy of Sciences</u>

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by Baylor & Baylor that describes how different disciplines looking at the same piece of data, the same, exact piece of data, would draw totally opposite conclusions about the nature of the interactions.

In the Ken Rothman book Modern Epidemiology, he actually uses the Selikoff asbestos and smoking data to point out that, without understanding the biological nature of what's going on, you can make any conclusion you want. It's not scientifically based. And in the second edition of that book, edited by Rothman and Sander Greenland from UCLA, they have -- in Chapter 18 on interactions, they have a very thorough examination of what's going on with interactions.

And the clearest example of an interaction -- this is hypothetical, now. You have an end point; you have lung cancer. You have two exposures that you're -- three exposures you're absolutely certain about. You have -- and everybody is exactly the same except for these three exposures. You have people exposed to asbestos, you people exposed to cigarette smoke, and then people jointly exposed.

The clearest example of synergy would be

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if there was no association with lung cancer and asbestos and no association with smoking, but the two together you saw it, okay? That would be the strongest evidence for synergy. Since both produce this disease, as evidenced from these epidemiological studies, there is -- until you understand the mechanism, there's no way you can do it.

So when you use the word "multiplicative," if you're an epidemiologist, the way the epidemiology studies are derived and the relative risk numbers, those numbers mathematically are logarithms, okay? And you add logarithms by multiplying. Now, this is -- for somebody who's a biostatistician, a statistician, an epidemiologist, it's pretty straightforward.

So when you have a relative risk of one for a nonsmoker, non-asbestos exposed, and a five if you're asbestos exposed, and a ten if you're a smoker, and a 50 if you're a jointly exposed person, and you're an epidemiologist, you're in logarithmic space, okay? The way it's done -- it's like the Richter scale. You know, you have earthquakes. An earthquake seven versus an earthquake eight is not a difference of one. It's a difference of a thousand, okay, because that -- pH is in a similar kind of

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space. It's a way that you can construct the environment that you can do some robust analysis on. It's a transformation. There are many kinds of transformations.

An interaction is not simply whether it's multiplicative or not. An interaction is does exposure to one modify the effect of the other. So if exposure to asbestos increases the risk by a factor of five in a nonsmoker, what does it do in a smoker? And if you use -- I'm just picking those numbers because it's simple mathematically. If smoking is ten and the joint effect 50, it says that asbestos is doing the same thing in smokers that it's doing in nonsmokers.

Then you go down the other way. If smoking increases the risk by ten in nonsmokers, what does it do in asbestos exposed? It increases it by ten. If there was an interaction -- and there are two kinds of interactions in general. There is the one that you call synergistic, and the prediction would be that instead of 50 you would see a much higher number. If there's an antagonism, you would see a much lower number. And the reason I'm saying "much higher" and "much lower" is because the precision of these numbers are -- they're not that

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tight. They have a wide range. So you have to see big differences to be able to make that conclusion.

So multiplicative doesn't tell you whether there's an interaction. You have to have the context. So if you're an epidemiologist, that's the world you live in, and that's what you see. If you are an epidemiologist who's concerned about public health questions, okay, and you see that number 50, it doesn't matter what it is. It's just a bigger -- a much bigger number than either one alone.

The animal studies, where they jointly expose to asbestos and smoking, don't show anything that would suggest synergy. Most of the asbestos fiber burden studies -- I'm thinking of Roggli down at Duke, who's published on this, don't -- I would have predicted, because smoking has been associated with inhibition of clearance, that if you're a smoker and exposed to asbestos, you might see more asbestos fibers, and that might explain this increase. In general, that's not what he's reported. Other people have seen it. Some other people haven't. There's a whole argument about the technique to do the measurement. I'm not a pathologist, I'm not an expert on measuring fibers in people, but I understand that there's not a total agreement on

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this.

So I would say you and I can talk and argue about this until we're blue in the face; you know, we can talk about log space, linear space, toxicology, epidemiology. At the end of the day, all that really matters is people that are jointly exposed have a greater risk than if they are just exposed to asbestos or just exposed to tobacco smoke.

Q. Has that been known since 1968 and accepted in the scientific and medical community?

A. Has what been known?

Q. That you have a greater risk.

A. It's been known for a long time. I can't tell you whether it was 1968, but it's been known for a long time.

Q. Since Dr. Selikoff published the first study on smoking asbestos workers?

A. Well, I mean, the first study, these what are called sentinel studies, are generally speaking, from a scientific and regulatories perspective, not used as the hallmark or foundational studies upon which to do stuff. And there were sufficient issues with the Selikoff study that other studies have been done, and I think there are approximately two dozen studies that have been published in epidemiology that

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have sufficient information to at least say something about the joint exposure, and the Selikoff observations sort of stand alone in terms of some of their findings compared to the other studies.

But having said that, my conclusion, based on reviewing the data and looking at Peter Lee's report and manuscript, I believe that the epidemiology is supportive of asbestos is associated with an increased risk for lung cancer, smoking is, and the joint exposure produces a further increased risk, and there's no interaction.

(Discussion off the record.)

Q In trying to speed this up and finish this today, you're familiar with the opinion in the controversy document published by the Tobacco Institute in 1979?

A Yes, sir.

Q You're familiar with the claim they made with regard to asbestos and smoking?

A Not specific. I may have -- I may have seen it, but I don't remember.

Q I can look for the exact quote, but I think the gist was that any claim that it's the

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smoking that's responsible for the excess risk of lung cancer in the asbestos workers is not justified. Do you recall -- I mean, we can stop and --

A I don't specifically recall that, but I mean, if you want me -- if you go Scout's Honor, that's pretty much what they said, I --

MR. FORMAN: Do you accept that? I think that's pretty close.

MR. COFER: Scout's Honor. For purposes of the question, we can assume that's what they said. How about that?

THE WITNESS: Okay.

Q Was that a fair and accurate representation of the state of the literature at that time?

A I think it still is.

Q It's not justified to say that smoking is responsible?

A I don't think anybody knows.

Q That smoking has any effect on asbestos-exposed workers?

A No, I didn't say that.

Q You don't think what they said was misleading, then?

A Well, as I understand -- I haven't spoken

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to whoever wrote this document, so I don't know their level of understanding, but my level of understanding, as you paraphrased their statement, I would say I don't know smoking's contributory role in that situation.

Q Certainly, it had been reported many times by 1979 that asbestos workers who smoked had a higher risk than asbestos workers who didn't smoke.

A I think that's true.

Q And that it was substantially higher than the risk in the asbestos workers who didn't smoke?

A Generally speaking, that was true.

Q And wasn't the gist of what the Tobacco Institute was saying is you can't blame that increased risk on smoking?

A I don't know what the gist -- I don't know what whoever wrote this intent was, what they knew, what they didn't know, what they understood and what level they understood it at.

(Off the record.)

Q Looking at Page 77 of the document known as the Continuing Controversy, published by the Tobacco Institute in 1979, which states "Any conclusion that it is the smoking which is

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responsible for the reported increased risk of lung cancer in the smoking asbestos worker is not justified on the basis of available evidence," now, do you agree with that statement?

A As I said, as I understand it -- I'm not saying that whoever wrote this has the same understanding that I do, not just of the human epidemiology data, but the animal data. I don't think at that point there was any fiber -- asbestos fiber data plus or minus smoking. You couldn't demonstrate any synergy in the animal -- any interaction in the animal studies, and since nobody knows the mechanism that's going on here, I think you can't ascribe what's going on to anything in any specific way. There's too much unknown about this, from my -- from my perspective. Would I say that to anybody today? No, I wouldn't, because from my perspective, not as a lawyer, not as a litigator, but from a public health perspective, I think the issue is clear.

Q Are you aware of any scientific investigators as of 1979, not connected with the tobacco industry, who said that the increased risk of lung cancer in smoking asbestos workers is not due to smoking?

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A I don't know if I can say using those precise words, but some of the summary review documents, putting aside Peter Lee's, one could infer that nobody really knew what was going on other than asbestos workers shouldn't smoke, besides people in general not smoking from their perspective.

Q Would you agree that a number of studies had concluded by then that in the absence of smoking, the lung cancer risk of asbestos workers was not considered to be very great?

A Relative risk of five to me is -- I can't imagine that it would not be considered not very great by anybody else. I think that's a big number.

Q Aren't you familiar with a number of studies of asbestos workers who showed a risk far less than five?

A And far greater than five as well.

Q What do you know that's far greater than five?

A There are within the at least 24 studies that had joint exposure some relative risk numbers that were greater than five. I would have to go back and look at the reports to pull them out, but there were some less than five and some greater than five.

Q Are you familiar with any studies of

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American exposed asbestos workers suggesting the risk from asbestos exposure for lung cancer was greater than five?

A American exposed? I'd have to look at the summary tables to be able to answer that question. As I sit here today, I can't recall off the top of my head.

Q You indicated in your report that the ingredients and additives as used in cigarettes -- "It is my belief that the ingredients slash additives as used in cigarettes are not armful to smokers." That's not to suggest that you don't believe smoking causes disease?

A Absolutely not.

Q Is it to suggest that the ingredients or additives play no part in the disease that is caused by smoking?

A Play no part. I don't think that was the level of my analysis. My level of analysis was to look at the toxicology of the ingredients individually and collectively and then to look at the epidemiology data from around the world in which cigarettes with and without ingredients are being smoked and then look at the lung cancer incidence in those parts of the world. And there is no -- based

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on the toxicology, there's no indication that the ingredients are doing anything above and beyond what tobacco smoke is doing; and then based on the epidemiology, there's nothing out there looking at cigarette markets in which ingredients are not being used or are being used to suggest that there's anything in terms of the use of the ingredients that is modifying the lung cancer incidence.

Q. Has Philip Morris done any investigation of the interaction between cigarette smoke and organic materials or tobacco filter fiber?

A. I think prior to, during and after Dr. Pauly's (ph.) publication from Roswell Park, there were a number of evaluations done, and our conclusions were pretty much consistent, I think, with the response that Dr. Chris Coggins made -- I don't know if he was at J. R. Reynolds at the time or at Lorillard -- basically pointing out what I would call scientific and technical flaws with Dr. Pauly's observation as not being consistent with the inhalibility of filter fibers nor in the identification that he made in the animal studies that he did, and our evaluations are pretty much consistent with the published evaluations by Mr. Coggins.

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Q So far as you know now, that is not a problem in cigarettes?

A In our cigarettes.

Q Is that one of the things that -- I believe the Institute of Medicine commented on that, said "This report has not reviewed potential cancer risks due to fibers released from cigarette filters or tobacco additives because it is thought that the risk of those exposures are substantially lower than the risk from the constituents from tobacco smoke."

A Well, in terms of the additives, the ingredients, Dr. Lewis Sullivan, when he was the head of Health and Human Services, when asked to comment on that, would not get involved in additives. He said the issue is tobacco, so -- and in terms of fibers, I think the risk is -- if there is a risk is so low as to be zero, if there is a risk.

Q They do gone on to say "However, there are no existing data to prove this assumption." Is that correct to your knowledge?

A There are no existing data in a systematic way at this particular point other than the information I've given you.

Q Are you aware of any independent scientific studies on the effect of specific tobacco

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public statements and press releases on the smoking public?

A Say that again.

MR. COFER: Do you just want to have it read back?

(Court reporter reads back previous question.)

MR. COFER: Object to the form.

A No.

Q You have read, I'm sure, the articles that appeared in the *Journal of the American Medical Association* in 1995 on the Brown and Williamson documents.

A I can say I've looked at them. I can't say that I have studied them.

Q Are you aware of any independent assessment of the tobacco documents that are housed in archives which have concluded that the tobacco industry has been unfairly characterized by the published articles like those in the *Journal of the American Medical Association* that I referred to?

A I can tell you I have -- if they exist, I probably wouldn't pay any attention to them anyway.

Q How many of the documents in the archives

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have you read of the 26 million documents, so to speak, in the Minnesota archives?

A I have read -- if they were Philip Morris documents, I've read or have been shown a significant number. If they are other companies' documents, the only other company documents I've seen are documents shown to me by plaintiffs' lawyers.

Q Have you reviewed any expert reports of the plaintiffs' experts in this case?

A No, sir.

MR. FORMAN: Is it fair to state he's not going to comment on those specifically at trial?

MR. COFER: I don't know, I don't know.

MR. FORMAN: Well, he didn't mention it in his report, so I'm not going to ask about it, assuming that that's going to be the case. I'm going to rely on what he said in his report.

MR. COFER: You can rely on what he said in his report.

MR. FORMAN: I just want to be sure. I'm pretty sure that's the case.

Q Now, you do say "I may be asked to comment on the opinions expressed by other witnesses to the extent they relate to my area of expertise." Now,

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I'm not sure what you mean by that.

A The points that come prior to that, whatever six -- whatever the number of things I'm capable of or identified to comment on, if you were to have somebody get up and comment on one of those areas that I've listed, I think, then it's --

MR. COFER: Say, for example, you have a witness who says it's the additives, not the tobacco; it would be fair to assume that Dr. Carchman would say, "That witness is wrong. It's the tobacco, not the additives."

Q How about -- for example, just to make sure we're on the same base here, do you plan to comment on Dr. Blot's epidemiology model in this case?

A I haven't seen it.

MR. FORMAN: So if he's not, I don't need into go into that; is that fair?

MR. COFER: That's fair.

Q What is the highest published risk, relative risk, you've seen attributed to cigarette smoking as a cause of lung cancer?

A Well, we have talked about overall risks, the ten and 20 number; but depending on the specific situation in terms of years of smoking, number of

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cigarettes, it could be a hundred or more.

Q The Cancer Prevention Study I, Cancer --

A CPS I.

Q CPS I and CPS II.

A Yes.

Q Do you agree that the lung cancer risk in males essentially doubled in CPS II versus CPS I?

A I think as a matter of fact that that has been reported, yes.

Q And do you agree that the CPS II study indicated that the relative risk of lung cancer in nonsmokers had not changed since CPS I?

A As the basis of comparison, I think the answer is on one level, yes, but as Thun and Heath have pointed out, that the comparison of CPS I and CPS II may be confounded by the fact that the populations are really quite different, and there may be some disparities in that they published this in '97. They were trying to explain what might be going on, and they said, Maybe we haven't taken into account differences between the two populations. For example, one of the things they suggested that needed to be looked at was the length of time people smoked may have been different between the two. And that becomes important in their mind and in my mind

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because of some of the theoretical work that Dr. Doll, Sir Richard Doll, has done in terms of the relationship of smoking and disease and the factors that most greatly influence those numbers. And Drs. Thun and Heath basically felt that may not have been taken into account sufficiently, and that may help explain at least in part, but they don't know and I don't know.

Q What is the publication you referred to by Thun and Heath?

A It's a '97 publication. It may be in my reliance documents.

Q You just don't recall the name of it?

A The journal?

Q Yes.

A Not off the top of my head.

Q Are you essentially saying by all those comments you just made that the higher risk of lung cancer in the CPS II group may be due to the fact they smoked for a longer period of time?

A I would say that was one of the conclusions by Thun and Heath. And I am sensitive to the hypothetical model, mathematical model, that Sir Richard Doll has used in a recent publication out of Japan by Yamaguchi in one of the epidemiology

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journals. They basically took the Doll model and showed how it fit in the Japanese population, how it explained, at least from their perspective, the changes in lung cancer incidence in Japan. And I think Thun and Heath were basically saying, you know, We haven't quite looked at this particular perspective, and it may be important in understanding what these differences are. And I think that's an important thing to look at.

Q Do you have an opinion as to whether the length of time that a person has smoked is relatively more important than the number of cigarettes per day smoked?

A That's the Sir Richard Doll concept. It's to the four-and-a-half power, whereas the number of cigarettes smoked is only to the one-and-a-half power, which is the same number you get just as a function of aging. So one way of looking at it is if you weren't a smoker, just getting older would be the equivalent of smoking six cigarettes a day. When you look at the mathematical equation, one can infer that. So just getting older is as important as the number of cigarettes you smoke.

In his model, the most important characteristic -- I'm not saying the number of

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cigarettes smoked is not important, but the most important characteristic numerically is the duration of smoking. And the Japanese data were very important because it pointed out that smoking prevalence is not a robust enough measure to look at in terms of lung cancer risk. They had to factor in the number of cigarettes and the duration, and then it fit.

The model then fit the data in Japan, which then fit Doll's data in the UK. Maybe Thun and Heath or Thun has done that, or is doing that. I don't know. But they raise that as an issue, and I think it's an important consideration.

Q. Do you plan to offer any testimony as to whether cigarette smoking is or is not a cause of interstitial fibrosis of the lungs?

A. In the -- in my Felise deposition -- it never came up in the trial testimony, but I believe I was asked that question in that deposition.

MR. FORMAN: Is that something you plan to address with him?

MR. COFER: I would go ahead and ask him about it.

MR. FORMAN: Then, I'm sorry, I may not make it.

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Q What opinion do you have about cigarette smoking as a cause of increased interstitial fibrosis in asbestos-exposed workers?

A I think the first place I start is what is the relationship with cigarette smoking and interstitial fibrosis. I would say there's data on both sides of this, but in general they don't really favor -- and I'm not saying I'm weighing it, that there are more studies that say it doesn't than say it does, but in general I think the feeling is that it doesn't.

In terms of the relationship between asbestos, which clearly has been associated with interstitial fibrosis, my own feeling, based upon the review that I have done, is clearly smoking is strongly associated with obstructive pulmonary disease. Asbestos is really a restrictive lung disease, and it's things like interstitial fibrosis that really do -- that is one of the key elements, I believe, on that side. And I'm not convinced that smoking is somehow facilitating interstitial fibrosis.

Q Do you have an opinion as to whether cigarette smoking has been shown in the literature to increase the risk of a diagnosis of asbestosis?

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A I have seen -- I have seen some studies on that, but it would require a level of radiographic expertise and pulmonary expertise that I don't feel comfortable with at this point.

(Discussion off the record; break taken for reporter to change disks.)

Q On the smoking and fibrosis issue, as it relates to asbestos workers, what literature have you reviewed that would indicate that asbestosis is diagnosed more frequently in smoking asbestos workers than in nonsmoking asbestos workers?

A I have looked at, for instance, several editions of Harrison's Internal Medicine, I've looked at some reviews that were published I think in the *New England Journal of Medicine*, and some other reviews. I have not focused very much on individual studies, but relied upon to some degree on what experts in the field have said about this.

As I indicated before, I know there are standards, medical standards, for these diagnoses, and I am neither a radiologist nor a pulmonologist, and those standards require at least that kind of expertise.

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Q Incidentally, just looking through this Institute of Medicine, I see there's a section of Synergistic Effects with Other Pollutants at Page 10-12 that refers to "occupational exposure to material such as asbestos have been proven to have a synergistic interaction with tobacco smoke leading to greatly increased production of lung tumors in exposed workers who smoked." So is that kind of statement something fairly common in the literature? I don't want to go back through the discussion about the synergy and multiplication.

A I don't blame you. I think that is a common statement.

Q And is that sort of a reflection of maybe the bottom line of what you said, and it doesn't matter what you call it, there still is that greatly increased risk that needs to be taken into account from a public health standpoint?

A That's my perspective.

Q Do you agree, Dr. Carchman, that several different theories have been postulated in the literature as to an explanation for how asbestos-exposed workers who smoke could be diagnosed with asbestosis more frequently?

A I am -- I'm sorry, were you finished?

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Q There have been several different potential explanations; do you agree with that?

A I believe I have read that, yes.

Q One being that asbestos workers who smoke may retain more fibers in their lungs that leads to a diagnosis of asbestosis?

A Right.

Q Two would be there may be some interaction between smoking and asbestos fibers that lead to an interaction within the lung at the cellular level that would cause increased fibrosis.

A Actually, the first one would also be potentially an interaction as well.

Q Yes.

A Yes, I've read that as well.

Q Then the third might be that smoking may cause what's been described in the literature as "dirty lung" in and of itself at low profusion levels of fibrotic changes in the lung that could even be confused with asbestosis.

A I have -- I don't know if they rise to the level of theories. They are clearly hypotheses, and my understanding here is that the criteria that have been established in terms of identification, if they're carried out appropriately, this should not be

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a problem; and some of the confusion may be related to the fact that not everybody follows the guidelines or suggestions as well as they should. But yes, I have read that.

Q Is there any one particular author or series of authors whom you would consider to have special expertise in this area?

A None that I can think of as I sit here right now.

Q Looking at the Institute of Medicine report at Page 14-2, there's a table there, Table 14-1. Are you familiar with that table?

A Yes.

Q And does -- how is the table described? What is the title?

A "Table 14-1, Smoking-Affected Pulmonary Diseases, Disease Incidence or Severity Definitely Increased by Smoking," and this is -- this table is modified with permission from the authors of a paper published in the year 2000, in a book <u>Smoking-Affected Pulmonary Disease from Clinics in Chest Medicine</u>, and there is a -- there are two areas: Disease incidence or severity definitely increased by smoking and disease incidence or severity possibly decreased by smoking.

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And in the first category, disease incidence or severity definitely increased by smoking, there is a list of one, two, three, four, five -- a dozen items and the penultimate one is asbestosis.

Q So at least according to this publication, asbestosis is one of those diseases whose incidence or severity is increased by smoking?

A That's correct.

Q Are you familiar with the studies of Dr. William Weiss, W-E-I-S-S, in this area?

A What institute is he --

Q I think he's in Philadelphia, but I'm not sure if he's with a particular institute or not.

A The name is on my radar screen, but I can't attach it to anything at this time.

Q Would it be fair to state, then, that, as you've said earlier -- I think this is what you said, that you really haven't studied the individual articles so much as you have sort of reviews of the subject?

A That's correct.

Q And if we were to start going through individual articles, that's not something you studied?

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A That's correct.

Q I found the Goodman Paper. I thought I had it somewhere. This is the paper by Goodman, Gorman, Ray, Malloy and Zale called "Cancer and Asbestos-Exposed Occupational Cohorts: A Meta-Analysis." Is that the paper that we were discussing briefly earlier?

A I think so, yes.

(Discussion off the record.)

MR. COFER: Why don't you read the cite in the record, so we will be able to locate it.

MR. FORMAN: I believe it's Cancer Causes and Control, Volume 10, Page 453 through 465.

A And a year?

Q 1999.

MR. COFER: Thank you.

Q Looking at Table 2 of this study on Page 458, do they conclude that a meta SMR -- and would you explain what a meta SMR is.

A Well, an SMR is a mortality ratio. It's a less robust measure of -- say compared to a relative risk or odds ratio, and a meta-analysis, if indeed -- I don't remember precisely whether they

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performed a standard meta-analysis or they just aggregated the summary data from the reports, or they actually looked at the raw underlying data -- is a way of taking data from individual studies and combining them, because -- the reasons you do that is that you are concerned that there's not enough power, statistical power, in any one study. It's not robust enough to draw any inferences about it.

So if you have 20 studies versus 20 individual studies and you put them together, it should provide some guidance as to whether there is something there or maybe there isn't anything there. But when you do that, there are some other tests that you have to do. You have to also test for heterogeneity, statistical heterogeneity, which basically gets at the question: Can these data be combined, the combinability of these data.

And there are lots of things that you have to do, but it's -- it's an attempt to combine information that by itself may not be that useful to try to give you some confidence that you can maybe say something about the overall picture.

Q They indicate the overall meta SMR for lung cancer is 163.

A Yes.

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Q And they looked at, I believe, 69 asbestos-exposed occupational cohorts.

A Yes, that's -- yes.

Q Now, looking at the Discussion portion of the paper, on Page 461, would you agree with this: "The association between lung cancer and occupational exposure to asbestos has a wide range of estimates"?

A Absolutely.

Q "With the majority of studies showing relative risk estimates exceeding 100 but less than 200."

A For their analysis I think that's looking at 69 studies wouldn't be unrealistic.

Q He refers to a publication by Lash, et al. Are you familiar with that publication?

A Yes.

Q I don't have it here, but I just see it referenced there, and he says "their analysis," referring to Lash, "using linear dose-response models revealed that the measure of potency of asbestos to cause lung cancer differed by occupational cohort." Would you agree with that?

A I think -- putting aside the validity of using a linear extrapolation, which may or may not be valid, I think that different kinds of occupational

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cohorts exposed to different kinds of asbestos and different kinds of asbestos fibers could suggest different levels of activity that could be expressed as differences in potency. But let me just point out a significant caution here, that in order to arrive at that conclusion, you would have to have relatively complete dose response curves for the different cohort studies and be able to demonstrate that the maximum response achievable was at the same level. And what you're looking for are parallel shifts in the dose response curves, and so you can only talk about potency where you have maximum responses that are close.

In other words -- if I draw something, then it ends up in the record here. (Drawing diagram.) So that would be concentration and this would be zero, and it would be increasing in that direction. This would be zero, and that would be the response. So let's say these represent data from different cohorts.

MR. COFER: When you say "these," describe what these is.

THE WITNESS: These lines, each one of these lines.

MR. COFER: Squiggles, right?

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A In somebody's mind. They are lines to me. They are squiggles to Mr. Cofer. Let's say, for the sake of argument, these represent data from individual cohorts. You can compare only the potency of these three cohorts, not this one, because it doesn't achieve anywhere near the same maximum response.

And so what you would do is -- let's say you would go to the level that produced 50 percent, half the response. Let's say it's here. Then you would draw this line through here. Then you would draw the line down. And let me just make an arbitrary assumption. Let's call this "1," call that "2" and call that "3." So this is at one unit of dose or concentration, two units of dose, three units of dose. What this says -- potency says that whatever this is here is three times more potent than that and twice as potent as that.

But you can only make this potency statement, one, based on having a description of the dose response curve, and it could be -- you can only look at the linear part. I don't have a problem with that, but it's only comparable from a potency perspective if it achieves the same maximum response, and I seriously doubt that anybody's been able to do

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that with these asbestos cohorts.

So whatever they're talking about with regard to potency I think is relatively limited because I don't think there's that kind of information out there, one, and No. 2, as I said before, most of the information on exposure is not related to objective measures of exposure. It's based on job classification or, gee, it's pretty dusty in here.

MR. COFER: Let's go ahead and mark that.

(Carchman Exhibit 19 is marked.)

Q Have you undertaken, Dr. Carchman, a study, for example, of various cohorts -- let's say shipyard workers exposed to asbestos. You recall there have been a number of studies published on shipyard workers?

A Yes. The only studies that I focused on were about two dozen studies that had some ability to look at the joint exposure of asbestos and smoking. So there are only about two dozen of those, and of which not all of them have really enough data on one aspect or another. I did not look at 69. I only focused on those studies in which there was

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information I could use that would allow me to make any statements at all. Because of the tremendous variability in all of these studies, I think the best chance you have is to go within a study that had information on both smoking and asbestos exposure.

Q Putting aside the issue of smoking for a minute now and just focusing on studies of asbestos exposed shipyard workers, for example, there have been a number of those kinds of studies published in the literature, you recall?

A Based on not just shipyards, but different kinds of occupations, people that work the brakes and whatever. Yes, there have been a variety of occupations.

Q For the shipyard workers, sofar as you know, have most of those studies indicated a relative risk of lung cancer of less than two?

A I can't answer. I can't answer that question. I just don't know enough to answer that question.

Q I'm looking at Page 462 of the Goodman Paper, where it states "It is clear that when evaluating asbestos contribution in individual lung cancer cases, one has to consider epidemiologic literature in its totality. The risk of developing

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lung cancer in a construction worker with low levels of exposure to asbestos cannot be equated to that in an insulator from the Selikoff cohort." Would you agree with that concept?

A I think so, yes.

Q And in their Conclusion it's indicated that "It is also clear from the analysis that the magnitude of this association" -- let me just read the sentence before to put it in context. "Analysis presented in this paper allow us to conclude that besides mesothelioma, lung cancer is the only malignancy that demonstrates unequivocal association with asbestos exposure." Any agreement or disagreement with that?

A I generally agree with that.

Q "It is also clear from the analysis that the magnitude of this association is frequently overestimated with great differences between the types of exposures and with the majority of occupational cohorts showing less than a twofold increase in risk."

A I agree with the first part. In fact, in Peter Lee's review of this, he strongly cautions the reader to pay attention to the high variability and the quality of the studies; and as I think I said

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earlier, there is a large range of reported numbers for asbestos. So I think Peter Lee cautions that. I think Goodman, et al. cautions consideration of that as well.

Q Do you agree that the majority of the reported cohort studies have shown less than a twofold increase in risk?

A I have not examined the 69 studies to be able to do that, and I don't know what he means by majority. Does he mean the numerical majority giving each study equal weight, or have they weighted the larger studies more than -- is he giving equal weight to large studies and small studies? I don't think they give enough information there to be able to answer that question.

Counting studies, to do that I think is a perilous undertaking, and going back to a reference I gave earlier in *Modern Epidemiology*, Rothman and maybe Rothman and Greenland strongly object to the -- to that approach, if indeed that's the approach Goodman, et al. are taking.

Q Have you ever criticized this paper in any prior testimony?

A I don't know. The only other testimony I've given in which this paper would come up would

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have been Felise.

Q Have you prepared any written analysis of the paper?

A No. This is one of maybe six reviews that have been published on asbestos and smoking.

Q We are almost through. I'm looking at a chapter from the NCI Monograph No. 8. The title of the paper is "Trends in Tobacco Smoking and Mortality from Cigarette Use." Are you familiar with that?

A Yes.

Q Looking at Page 313 they report that the mean number of years of smoking was higher in CPS II among older age groups of males.

A I think that goes to the --

Q Issue we talked about earlier?

A Yes.

Q And that age-specific death rates among both male and female smokers were substantially higher in CPS II as compared to CPS I for all ages older than 50. Do you agree with that?

A That's what it said.

Q I mean, do you --

A That's what their data -- that's what the data they reported on said.

Q It says "Among lifelong never smokers, the

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lung cancer death rate changed relatively little from CPS I to CPS II." Would you agree with that?

A Well, that's what they said.

Q I mean, do you have any reason to think that's wrong?

A Well, we actually have the raw data tapes from CPS I and CPS II, and we're examining the raw data to understand this, to understand this better.

Q Do you have any basis to disagree with it as of now?

A I have no basis to agree or disagree with it.

Q The rate of lung cancer in male smokers nearly doubled from CPS 1 to CPS II. What is your -- is your explanation basically the primary reason is the longer period of smoking?

A No, I don't know what the reason is. Neither does Thun and Thun and Heath in their publication. That is a possible explanation. There are other alternative explanations for that, too, some of which they go into here.

Q Would you agree with this statement on 328: "The large increase in death rates from CPS I to CPS II probably reflects unmeasured heavier smoking in CPS II during the 1940's and 1950's as

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well as the measured increase in daily consumption and duration of smoking"?

A That actually is one of the important questions that we're looking at because represented in the CPS II population are a significant number of people who smoke non-filtered cigarettes, and we're trying to -- we're trying to see if we can get a handle on this, because that would be very important to know the answer to that question.

Q And then on Page 329 it says "Despite the many uncertainties that can strain the ability to compare the intrinsic carcinogenicity of cigarettes from these two eras," being CPS I and CPS II, "the net effect of all changes in the cigarette and the smoking of cigarettes has been a large increase rather than decrease in lung cancer mortality in smokers."

A That's an interesting statement from this CPS I, CPS II. I only point to the NCI SEER data in which Dr. Thun was a coauthor of the publication Wingo, et al., JNCI April a couple years ago, where it's clear that the lung cancer incidence overall is decreasing, overall. In men it's clearly decreasing. In women it's plateauing. In men it started to plateau in the late '80's, and it's definitely down

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now. In women there's a bend -- a bend in the curve, and you can see that either in the '98 Surgeon General's report for some of the data they had or in the Wingo, et al. or the SEER data itself.

So there are some things -- there are some things going on that would seem to at least at one level not jive totally with what's going on with the relative risk, because the lung cancer incidence -- and when I say "lung cancer incidence," you can use "lung cancer mortality," okay -- because the lung cancer incidence is going down, lung cancer mortality is going down, I haven't quite figured out how to take the information in here with the national information on lung cancer incidence and say, This is how -- this is what it might mean. All I can do is look at data that are representative of the U. S. population, which is not CPS I and CPS II. Even though there are a million people in there, they are not representative of the U.S. population.

Do I believe what they are reporting for that population is accurate? Yeah, I think it reflects many of the things that are going on in that population; but the SEER data may be saying something else, and I haven't figured out how to resolve -- to resolve the two.

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Q When you say that this data is not representative of the population as a whole, would that -- by that do you mean that the CPS II cohort is more white --

A Yeah.

Q -- basically, more highly educated?

A You must have read the same paper I did, yes.

Q Higher income?

A Yeah. And I mean, to participate in this, they also have a different level of motivation that may be part of higher socioeconomic status, higher education. I don't mean to say that there's anything wrong with this. All I'm saying is your ability to generalize the whole U.S. population -- their observations are critically important. We are paying a lot of attention to it. We are just trying to understand what this means to the smoking population at large.

(The deposition ends at 5:07 p.m.)

AND FURTHER THIS DEPONENT SAITH NOT

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COMMONWEALTH OF VIRGINIA,

CITY OF RICHMOND, to wit:

I, Carolyn M. O'Connor, a Notary Public for the Commonwealth of Virginia at Large, do hereby certify that the foregoing deposition of **RICHARD A. CARCHMAN, Ph.D.** was duly sworn to before me at the time and place set out in the caption hereto.

I further, that the transcript of the deposition is true and correct, and that there were 19 exhibits filed with me during the taking hereof.

Given under my hand this 5th day of April, 2001.

Carolyn M. O'Connor

Carolyn M. O'Connor, RMR, CRR
Notary Public for the
State of Virginia at Large

My Commission expires:
May 31, 2001

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COMMONWEALTH OF VIRGINIA,

CITY/COUNTY OF , to wit:

I, **RICHARD A. CARCHMAN, Ph.D.**, do hereby certify that I have read the foregoing pages of typewritten matter numbered 1 through 222, that the same contains a true and correct transcription of the deposition given by me on the 28th day of March, 2001, with the exception of the noted corrections, to the best of my knowledge and belief.

_____ _____

Date RICHARD A. CARCHMAN, Ph.D.

Subscribed and sworn to before me this

_____ day of , 2001.

My commission expires _____ .

_____

Notary Public

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IN THE CIRCUIT COURT OF JEFFERSON COUNTY
STATE OF MISSISSIPPI

EZELL THOMAS, et al. PLAINTIFFS

AND

OWENS CORNING

VS. CIVIL ACTION NO.: 96-0065

R.J. REYNOLDS TOBACCO COMPANY, et al. DEFENDANTS

NOTICE OF VIDEO DEPOSITION OF RICHARD CARCHMAN AND REQUEST FOR PRODUCTION OF DOCUMENTS

PLEASE TAKE NOTICE that Owens Corning will take the deposition of Dr. Richard Carchman on March 28, 2001, at 9:00 a.m., in his capacity as a 30(b)(6) designee of Philip Morris, Inc. in the categories described on Exhibit A, and in his capacity as a fact and expert witness designated by Philip Morris, Inc. in this case, at the offices of Hunton & Williams, Riverfront Plaza, East Tower, 951 E. Byrd Street, in Richmond, Virginia

This deposition is being taken for all permissible purposes under the Mississippi Rules of Civil Procedure and Evidence, including but not limited to the preservation of testimony for trial.

Dr. Carchman is requested to produce to plaintiff, Owens Corning, all documents relied upon or reviewed in connection with his expert opinions, including any documents provided to his by any Tobacco Defendant or such defendant's agent or representative (including any attorney) ten days prior to the deposition.

The deposition will be conducted upon oral examination before an official court reporter or other individual duly authorized to administer oaths, and will be recorded stenographically. The deposition will continue from day to day until completed.

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EXHIBIT
Carchman
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You are invited to attend and participate in the manner provided in the Mississippi Rules of Civil Procedure.

This the 12th day of March, 2001.

Respectfully submitted,

FORMAN, PERRY, WATKINS, KRUTZ & TARDY, PLLC

By: _____

RICHARD L. FORMAN, MS BAR #5427
WALTER G. WATKINS, JR., MS BAR #6988
TIM GRAY MS BAR #10192

OF COUNSEL:

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Post Office Box 22608
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CERTIFICATE OF SERVICE

I, Tim Gray, one of the attorneys for plaintiff, Owens Corning, do hereby certify that I have this day served a true and correct copy of the foregoing Notice of Deposition via facsimile upon all counsel listed on Exhibit "B" attached hereto.

THIS, the 12th day of March, 2001.

_____
Tim Gray

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February 7, 2001

VIA TELEFAX and U.S. MAIL

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RE: Owens Corning

Dear Tim:

This letter will confirm that Dr. Richard Carchman is available for deposition on March 28, 2001 in Richmond, Virginia. In addition to being a fact and expert witness, Dr. Carchman will be Philip Morris Incorporated's Rule 30(b)(6) deponent for categories 4, 5, 6, and 9 of Owens Corning's Rule 30(b)(6) Notice of Deposition: "4. The medical effects of exposure to asbestos, including but not limited to, your position as to whether exposure to asbestos increases the risk of cancer of the lung in human beings, and if so, the amount of such exposure required to increase the risk of lung cancer in human beings, and the extent, if any, to which the risk of lung cancer is increased by such exposure to asbestos"; "5. The medical effects of exposure to asbestos among cigarette smokers, including, but not limited to, your position as to whether exposure to asbestos interacts synergistically or otherwise with cigarette smoking to increase the risk of lung cancer in human beings"; "6. The medical effects of exposure to asbestos among cigarette smokers, including, but not limited to, your position as to whether exposure to asbestos interacts synergistically or otherwise with cigarette smoking to increase the risk of fibrosis of the lungs or pleura in human beings"; and "9. The health effects of cigarette smoking on African Americans as a separate ethnic group." Additionally, Dr. Carchman will be Philip Morris Incorporated's Rule 30(b)(6) deponent for any scientific issues related to categories 1, 2, and 3 of Owens Corning's Rule 30(b)(6) Notice of Deposition: "1. The relationship between cigarette smoking and cancer, and whether there has been any change in the position of your company with regard to such issue within the past 10 years"; "2. The relationship between cigarette smoking and any non malignant disease and whether there has been any change in the position of your company with regard to such issue within the past 10 years"; and "3. Knowledge of or information about nicotine as an ingredient in cigarettes and the relationship between nicotine and addiction, and whether there has been any change in the position of your company with regard to whether smoking is addictive within the past 10 years."

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SHOOK, HARDY & BACON LLP

Please contact me to confirm Dr. Carchman's deposition.

Sincerely,

Bruce R. Tepikian

cc: Thomas Defense Counsel

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LORILLARD TOBACCO COMPANY

EXHIBIT
Carchman 2
cmo 3-28-01

SUPERIOR COURT OF CALIFORNIA

IN AND FOR THE COUNTY OF ALAMEDA

FIBREBOARD CORPORATION and OWENS CORNING,

Plaintiffs,

v.

R.J. REYNOLDS TOBACCO COMPANY; BRITISH-AMERICAN TOBACCO COMPANY, LIMITED; BROWN & WILLIAMSON TOBACCO CORPORATION; PHILIP MORRIS INCORPORATED; LIGGETT GROUP, INC.; LORILLARD TOBACCO COMPANY; JOHN DOES CORPORATIONS "A" THROUGH "Z,"

Defendants.

Case No. 791919-8

AMENDED CROSS-NOTICE OF DEPOSITION OF RICHARD A. CARCHMAN

Date: March 28, 2001
Time: 9.00 a.m.
Location: Hunton & Williams, Riverfront Plaza, East Tower, 951 E. Byrd Street, Richmond, Virginia
Judge: The Hon. Judge Ken Kawaichi

Action Filed: December 11, 1997
Trial Date: July 20, 2001

TO ALL PARTIES AND TO THEIR COUNSEL OF RECORD:

PLEASE TAKE NOTICE that pursuant to California Code of Civil Procedure section 2025, and this Court's Order dated July 17, 2000, Defendant Philip Morris Incorporated, through its attorneys of record, Shook, Hardy & Bacon L.L.P., hereby cross-notices the deposition of Richard A. Carchman, whose deposition has been noticed in his capacity as a Rule 30(b)(6) designee of Philip Morris Incorporated, as well as in his capacity as a fact and expert witness designated by Philip Morris

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Incorporated, in Ezell Thomas, et al v. R.J. Reynolds Tobacco Company, et al., Civ. Act. No. 96-0065 (Cir. Ct. Jefferson Cty., Mississippi), on March 28, 2001 at 9:00 a.m., to be taken before a certified shorthand reporter authorized to administer oaths in the State of Virginia. The deposition will take place at the law offices of Hunton & Williams, Riverfront Plaza, East Tower, 951 East Byrd Street, Richmond, Virginia 23219-4074, and will be recorded stenographically. A true and correct copy of the original deposition notice is attached.

By serving this amended cross-notice, Defendant Philip Morris Incorporated does not waive any objections to the original notice. If the location and time of this deposition changes, it changes in both this case and the Ezell Thomas case.

Dated: March 20, 2001

SHOOK, HARDY & BACON L.L.P.

By: Shannon L. Spangler
SHANNON L. SPANGLER

Attorneys for Defendant
PHILIP MORRIS INCORPORATED and
LORILLARD TOBACCO COMPANY

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IN THE CIRCUIT COURT OF JEFFERSON COUNTY
STATE OF MISSISSIPPI

EZELL THOMAS, et al. PLAINTIFFS

AND

OWENS CORNING

VS. CIVIL ACTION NO.: 96-0065

R. J. REYNOLDS TOBACCO COMPANY, et al. DEFENDANTS

NOTICE OF VIDEO DEPOSITION OF RICHARD CARCHMAN AND REQUEST FOR PRODUCTION OF DOCUMENTS

PLEASE TAKE NOTICE that Owens Corning will take the deposition of Dr. Richard Carchman on March 24, 2001, at 9:00 a.m., in his capacity as a 30(b)(6) designee of Philip Morris, Inc. in the categories described on Exhibit A, and in his capacity as a fact and expert witness designated by Philip Morris, Inc. in this case, at the offices of Hunton & Williams, Riverfront Plaza, East Tower, 951 E. Byrd Street, in Richmond, Virginia.

This deposition is being taken for all permissible purposes under the Mississippi Rules of Civil Procedure and Evidence, including but not limited to the preservation of testimony for trial. Dr. Carchman is requested to produce to plaintiff, Owens Corning, all documents relied upon or reviewed in connection with his expert opinions, including any documents provided to his by any Tobacco Defendant or such defendant's agent or representative (including any attorney) ten days prior to the deposition.

The deposition will be conducted upon oral examination before an official court reporter or other individual duly authorized to administer oaths, and will be recorded stenographically. The deposition will continue from day to day until completed.

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PLAINTIFF'S EXHIBIT

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You are invited to attend and participate in the manner provided in the Mississippi Rules of Civil Procedure.

This the 16 day of March, 2001.

Respectfully submitted,

FORMAN, PERRY, WATKINS, KRUTZ & TARDY, PLLC

By: _____

RICHARD L. FORMAN, MS BAR #5427
WALTER G. WATKINS, JR., MS BAR #6988
TIM GRAY MS BAR #10192

OF COUNSEL:

FORMAN PERRY WATKINS KRUTZ & TARDY, PLLC
Post Office Box 22608
Jackson, MS 39225-2608
(601) 960-8600

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CERTIFICATE OF SERVICE

I, Tim Gray, one of the attorneys for plaintiff, Owens Corning, do hereby certify that I have this day served a true and correct copy of the foregoing Notice of Deposition via facsimile upon all counsel listed on Exhibit "B" attached hereto.

THIS, the 16 day of March, 2001

_____
Tim Gray

Notice of Deposition Case Management

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February 7, 2001

VIA TELEFAX and U.S. MAIL

Tim Gray, Esq.
Forman, Perry, Watkins, Krutz & Tardy
1200 One Jackson Place
188 East Capitol Street
Jackson, MS 39225

RE: Owens Corning

Dear Tim:

This letter will confirm that Dr. Richard Carchman is available for deposition on March 28, 2001 in Richmond, Virginia. In addition to being a fact and expert witness, Dr. Carchman will be Philip Morris Incorporated's Rule 30(b)(6) deponent for categories 4, 5, 6, and 9 of Owens Corning's Rule 30(b)(6) Notice of Deposition: "4. The medical effects of exposure to asbestos, including but not limited to, your position as to whether exposure to asbestos increases the risk of cancer of the lung in human beings, and if so, the amount of such exposure required to increase the risk of lung cancer in human beings, and the extent, if any, to which the risk of lung cancer is increased by such exposure to asbestos", "5. The medical effects of exposure to asbestos among cigarette smokers, including, but not limited to, your position as to whether exposure to asbestos interacts synergistically or otherwise with cigarette smoking to increase the risk of lung cancer in human beings"; "6. The medical effects of exposure to asbestos among cigarette smokers, including, but not limited to, your position as to whether exposure to asbestos interacts synergistically or otherwise with cigarette smoking to increase the risk of fibrosis of the lungs or pleura in human beings"; and "9. The health effects of cigarette smoking on African Americans as a separate ethnic group." Additionally, Dr. Carchman will be Philip Morris Incorporated's Rule 30(b)(6) deponent for any scientific issues related to categories 1, 2, and 3 of Owens Corning's Rule 30(b)(6) Notice of Deposition: "1. The relationship between cigarette smoking and cancer, and whether there has been any change in the position of your company with regard to such issue within the past 10 years"; 2. The relationship between cigarette smoking and any non malignant disease and whether there has been any change in the position of your company with regard to such issue within the past 10 years"; and "3. Knowledge of or information about nicotine as an ingredient in cigarettes and the relationship between nicotine and addiction, and whether there has been any change in the position of your company with regard to whether smoking is addictive within the past 10 years."

EXHIBIT
A

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SHOOK HARDY & BACON L.L.P.

Please contact me to confirm Dr. Carchman's deposition.

Sincerely,

Bruce R. Tepikian

cc: Thomas Defense Counsel

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EXHIBIT B

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Produced by R.J. Reynolds Tobacco Company in Litigation

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SUPERIOR COURT OF CALIFORNIA

IN AND FOR THE COUNTY OF ALAMEDA

FIBREBOARD CORPORATION and OWENS CORNING, Plaintiffs, v. R. J. REYNOLDS TOBACCO COMPANY; BRITISH-AMERICAN TOBACCO COMPANY, LIMITED; BROWN & WILLIAMSON TOBACCO CORPORATION; PHILIP MORRIS INCORPORATED; LIGGETT GROUP, INC.; LORILLARD TOBACCO COMPANY; JOHN DOES CORPORATIONS "A" THROUGH "Z," Defendants.	Case No. 791919-8 **PROOF OF SERVICE BY HAND DELIVERY AND U.S. MAIL** Action Filed: December 11, 1997 Trial Date: July 20, 2001

PROOF OF SERVICE BY HAND-DELIVERY

I, Steve Hicks, am employed in the City and County of San Francisco, State of California. I am over the age of eighteen (18) years and not a party to the within action; my business address is One Market, Steuart Tower, Ninth Floor, San Francisco, California 94105.

On March 20, 2001, I personally served the following documents:

- **AMENDED CROSS NOTICE OF DEPOSITION OF RICHARD A. CARCHMAN**

52419 3203

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on the person(s) listed below by hand:

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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed at San Francisco, California on March 20, 2001.

STEVE HICKS

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President's Commission: Comments and Cover Letter- Philip Morris USA, 2/14/01 6:47PM

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February 14, 2001

Tobacco Commission
STOP 0574
1400 Independence Avenue, SW
Washington, DC 20250-0574

Dear Commission Members:

Philip Morris USA is pleased to submit the attached comments on the Preliminary Report of the President's Commission on Improving Economic Opportunity in Communities Dependent on Tobacco Production While Protecting Public Health. We look forward to working with the Commission as it completes its final report.

Sincerely,

Ellen Merlo
Senior Vice President,
Corporate Affairs

Comments of Philip Morris USA

TOBACCO COMMUNITIES AT A CROSSROAD:
The Preliminary Report of the President's Commission on Improving Economic Opportunity in Communities Dependent on Tobacco Production While Protecting Public Health

Tobacco Communities and Philip Morris USA: Sharing Perspectives, and Working Toward Our Common Goal of Sensible, Effective Regulation

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Introduction

Philip Morris Incorporated ("PM USA") is pleased to submit these comments on the preliminary report of the President's Commission. We believe that the preliminary report represents an excellent start, and has many sound suggestions for advancing important policy issues regarding tobacco and cigarettes in the United States. The Commission's request for public comment on the preliminary report is a welcome signal that it is seeking input from a variety of stakeholders, and will be seeking to create a final report that is balanced, practical and can be used as the basis for further discussions as these issues progress, both within and outside Congress.

We look forward to working with the Commission, and representatives of our nation's tobacco-growing communities, on many of the issues raised in the preliminary report, and to advancing our shared interest in finding ways to bring more stability, predictability and uniformity to the U.S. tobacco industry.

Because of our belief that it is the most important and timely of the issues raised by the Commission regarding that shared interest, these comments will focus on the preliminary report's proposal -- which we embrace -- for legislation that would, among other things, grant the Food and Drug Administration authority to regulate tobacco manufacturers, but not growers or their farms. Other items mentioned in the report, such as promoting fair trade in tobacco products, and moving tobacco quota into the hands of active growers, also merit discussion, and we would be happy to open a dialogue with the Commission regarding them at its convenience.

A Shared Perspective on Smoking and Health

As an initial matter, we think it's important to make clear that the views expressed by the Commission in Section II of the report, relating to harms caused by smoking, track very well with our own. Generally speaking, the Commission's message on these issues is our message, too.

PM USA supports a single, consistent public message on the role played by cigarette smoking in the development of disease in smokers, and smoking and addiction. We believe that there is no "safe" cigarette, and we agree with the overwhelming medical and scientific consensus that cigarette smoking causes lung cancer, heart disease, emphysema and other serious diseases in smokers. In addition, we agree with the overwhelming medical and scientific consensus that cigarette smoking is addictive.

Moreover, it is a fact that government agencies have concluded that secondhand smoke causes disease - including lung cancer and heart disease - in nonsmokers, and many people have health concerns regarding it. In addition, because of concerns relating to conditions such as asthma and respiratory infections, we believe that particular care should be exercised where children are concerned, and smokers who have children - particularly young ones - should seek to minimize their exposure to secondhand smoke.

For more information regarding our views on smoking and health, please visit our web site at http://www.philipmorrisusa.com.

Moving Quota into the Hands of Active Growers

PM USA shares the Commission's belief that efforts should be made to encourage the

Philip Morris Incorporated

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movement of quota into the hands of active growers. Currently there are provisions in the Federal Tobacco Program that would help achieve this, if strictly enforced. There may be other equitable methods to move quota into the hands of active growers instead of the quota buyout envisioned by the Commission; we believe those alternative paths should be explored, and are open to dialogue to see how they can best be followed.

Promoting Free and Fair Trade in Tobacco Products

PM USA fully supports the Commission's call for a review of U.S. Government policies regarding the export of U.S. leaf tobacco. American tobacco – which remains the highest quality in the world - as well as the manufactured tobacco products that are made from it, should be eligible to participate in all federal government programs, initiatives and efforts afforded other U.S. commodities, with the objective of allowing U.S. producers to compete fairly in export markets. We look forward to working with the Commission and the grower communities to find ways to advance this important goal.

Working Together to Achieve Sensible, Effective Regulation of Tobacco Products, While Protecting Growers from Additional Governmental Requirements

PM USA agrees with the Commission that Congress should pass new legislation providing for additional regulation of tobacco products, including provisions that would give FDA specific authority over the design and manufacture of, and health-related communications about, cigarettes. Moreover, we support the enactment of additional Federal restrictions regarding cigarette advertising and distribution, that would codify and sensibly complement those contained in the State tobacco settlement agreements, in the hope of taking further strides in our national effort to combat the serious issue of youth smoking.

The Commission is correct in concluding that these measures can be taken without affecting the current regulatory regime that tobacco growers have become accustomed to complying with.

Here are some examples of the specific kinds of provisions that we hope to work with the Commission to achieve:

- **Preserving the Current Role of USDA and EPA**. We fully embrace the Commission's proposal that USDA continue to have responsibility over the growing and production of tobacco, and that EPA should continue to regulate the use of pesticides on the farm. The regimes in place today involving these agencies are working well, and need not be disrupted. We also agree with the Commission that FDA is the most logical agency to regulate manufactured tobacco products and the companies that produce them. By carefully crafting appropriate legislation, Congress has the opportunity – in partnership with the States -- to create a coherent regulatory framework that will sensibly weave together the entire tobacco value chain – from the fields to the factories to the wide assortment of distribution channels.

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- **Ensuring That Regulation Will Not Equal Prohibition.** We are pleased that the Commission expressly notes in its preliminary report that the goal of new regulation should not be to ban tobacco products or their consumption by adults. As a responsible cigarette manufacturer, PM USA believes in the principle of adult choice. Cigarettes are a legal product that many adults enjoy despite the attendant risks. While it is appropriate for governments and health authorities to clearly identify health risks, and strongly encourage people to avoid harmful behaviors, we do not believe that they should prohibit adults from choosing to smoke. There are alternative approaches – including new product technologies – to reduce the overall harm related to smoking. We do not agree that the goal of any additional regulation should be to prevent adults who want to consume tobacco from doing so. Preventing minors' usage – yes. Making sure that adults continue to have complete information as the science evolves – yes. Promoting cessation – yes. Seeking to develop reduced-risk products for adults who decide to smoke – yes. But, so long as society continues to respect the values of tolerance and freedom, it should not be the goal of FDA to dictate the choices about tobacco that any adult can make.

- **Encouraging the Development and Responsible Marketing of Reduced Risk Products.** One of the Commission's critical recommendations is that FDA should have the authority to evaluate the relative harmfulness of different products. PM USA is committed to developing and marketing products that may offer smokers reduced risks as compared to traditional cigarettes, and has been a leader in calling for FDA to play an important role in developing criteria that would have to be met in order for a tobacco product to be designated as "reduced risk," and to regulate the claims that manufacturers make about any product meeting such criteria. Just as public health officials would object to reduced-risk claims that they have not had the opportunity to validate, consumers should view skeptically claims about new technologies that have not been sensibly regulated. And, we are mindful of the critical need for manufacturers to work with the public health community so that mixed messages are not sent that would obscure the fact that all smoking can be harmful, and that the best option from a health perspective is to quit or not to start in the first place. We believe that the best approach is for FDA, and not a tobacco company, to decide what is in fact "reduced risk", and what communications are appropriate on this subject.

- **Regulating Cigarette Ingredients and Smoke Constituents.** We think that FDA should be able to assure smokers that the ingredients added to cigarettes do not increase the existing health risks of smoking, including increasing addiction. We have already provided information about our cigarette ingredients to the Federal government and to consumers, and would support additional means of disclosure, as is the case for other consumer products, with the same confidential treatment of proprietary information related to the ingredients used in the "brand recipes" that give each brand its unique taste and flavor. Moreover, in addition to tar and nicotine, PM USA supports legislation that would enable FDA to require the disclosure of information about individual constituents in cigarette smoke that it believes would be meaningful to consumers, as long as the information can be generated according to a standardized and commercially feasible test method or reliably calculated on the basis of the test results.

- **Revising Health Warning Labels.** Consistent with the Commission's recommendations, PM USA supports granting FDA authority to revise the text of existing cigarette health warnings, and to determine the text of new ones.

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- **Providing Cessation Assistance for Those Who Want It**. We agree with the Commission that one legitimate area for FDA to be involved with is helping smokers quit who want to do so. Specifically, we think FDA should sponsor research into various cessation techniques, and recommend those that are found to be effective in assisting smokers who want to quit but are having difficulty.

- **Additional Measures to Combat Youth Smoking**. Finally, although the 1998 settlement agreements with the states made significant progress in areas such as youth smoking prevention, there are areas that we and the public health community agree need to be addressed through additional federal regulation. For example, PM USA supports a national minimum age of 18 for the purchase of tobacco products, and we believe that cigarettes should not be sold unpacked, as single cigarettes. We also think that cigarettes should be sold in a face-to-face transaction, where age can be verified and access laws can be monitored and enforced. In addition, there would be substantial benefit if the advertising restrictions from the settlement agreements, which today are only binding upon the participating tobacco companies, were codified so that they apply equally to all industry participants. With significant input from the retailer community and the States where they operate, we think that Congress can and should do more in this area.

Conclusion

PM USA looks forward to working with the Commission on completing its final report. Although these comments set forth some of our thinking on these matters, no one ought to attempt to dictate a solution to these complex issues; voices from across the political and economic spectrums - from the growers to the retailers, from the manufacturers to the public health community - need to be heard. By working together to find the common ground that unites us, we believe that the time is right to make substantial progress.

February 14, 2001

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File - Thames

This Week: Philip Morris

Dr. H.R.R. Wakeham, Vice President Science & Technology,
Philip Morris U.S.A.

being interviewed by

Mr. Peter Taylor, Thames Broadcasting Co., London

August 14, 1976

EXHIBIT # 4 CM03-28-01

Q. Dr. Wakeham, what is the purpose of the Research Center?

H.W. The research center is the focust of the technical effort on tobacco products in Philip Morris. It is there to prepare, to do the researches, and development, and process development, leading to the improvement of tobacco quality products.

Q. How does it operate?

H.W. Well, it operates like any research department. It has a research group that carries out basic, fundamental investigations, and then it has development and engineering groups, that translate this into the actual products and processes, needed to produce the products.

Q. How many scientists do you have working here?

H.W. We have a total of four hundred and fifty people, of which about two hundred are Bachelors, or better, college graduates, listed as our professional people. Of these, about fifty are PhDs.

Q. Can you tell me the kind of work that your peole do?

H.W. We do everthing in the line of the physical sciences and engineering relating to the requirements of the job. We do

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not do medical research, because that's another whole area, in which we are not expert.

Q. Why don't you do any medical research?

H.W. Well, there's a great deal of medical research being done on diseases that have been alleged to be caused by tobacco in the National Institutes of Health, and in the Council for Tobacco Research, which is an organization supported by the industry to explore the whole question of Smoking and Health.

Q. So, you have no medical people working for you, who can analyze the effect on the human body of the components of tobacco?

H.W. That's right. We leave that to the medical experts. You have to remember that the total effort, which is going into this problem in the national government, and in the industry-supported program is many times the magnitude of the effort in the Research Center.

Q. How closely do you work with the medical people?

H.W. We communicate with them a great deal. We keep following the literature. We may be giving them some advice with respect to the chemistry and physics aspect of the problem. We do analytical work for them sometime. But we don't do biological researches, and we don't do bioassaying, and the things of that sort. We provide them certain basic information, with regard to the product, which they need, to help them in their work.

Q. Are the medical people qualified to make the judgments they do?

A. Well, I can't answer that. I don't know what kind of qualifications are necessary. The medical people presumably are

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experts in what goes on in the body, what kind of causes there may be for diseases, and relations between cause and effect--with respect to human health.

Q. Does Philip Morris have any medical advisors, who are there to advise you specifically on smoking and health issues?

H.W. Not as a company specifically. We have a large number of people associated with the Council for Tobacco Research. This is an industry organization, which supports medical research in the field. We can make, we can use those people to give us suggestions and advice.

Q. What sort of advice are they giving you at the moment?

H.W. Well, the advice which--actually, they don't give us advice per se; we may ask them questions, which they answer. We get some clues with respect to how, maybe, the products might be made better from a medical point of view, by studying the results of those researches, and also by following what's being done by the National Cancer Institute in their Smoking and Health research program.

Q. Why did you develop Merit?

H.W. We developed Merit in response to a recognized demand for a good-tasting, low tar product. We had recognized many years ago that there was an apparent trend in the market place towards lower tar and nicotine delivery cigarettes. We asked ourselves how far down could you go in tar. We then proceeded to find out what kind of responses the consumers would have to very low tar cigarettes, and we found that it was very poor. So we decided that we need to

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do a great deal of research on the desirable aspects of a low tar cigarette, and what did people want when they smoked their cigarettes-in terms of taste and flavor. Because people were rejecting the low tar prototypes, and the low tar cigarettes on the market as a result of taste and flavor. So we engaged in a massive research program to discover what it was, and then we proceeded to apply that information in making the product.

Q. Why do people want low tar cigarettes?

H.W. I don't really know, except that possibly they've been subjected to the admonitions and exhortations of the public health people, who have said that low tar cigarettes should be less harmful.

Q. Do you believe that low tar cigarettes are less harmful?

H.W. I don't know whether they're less harmful, or not, but one of the problems, of course, is that it takes twenty years or so for the disease to develop--if you believe what their hypotheses say. If you subscribe to a dose/response relationship, then one would assume that the lower delivery cigarette might have less effect.

Q. Do you believe that your Merit cigarette, you've developed--

H.W. Yes?

Q. --is less harmful than your higher delivery cigarettes?

H.W. No. I have no basis for believing one way or the other on that. I don't know. I'm not an expert in the medical field.

Q. Isn't it strange to see a company, like Philip Morris, that questions the relationship between smoking and health, developing a low tar cigarette?

H.W. No. I don't believe it's strange. We're in the business

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to market cigarettes. We observed, during the last two years, that there was an increasing interest in the demand for low-delivery cigarettes on the part of the consuming public, and our business is to make cigarettes, which the public will buy. We looked at the market for cigarette delivery--say less than ten milligrams in 1975 and found that only one point four percent of the market was shared by all those cigarettes together. When we explored why people didn't buy more low tar cigarettes, we found it was due to the fact that they didn't like the taste. Our marketing research people had found that nine out of ten smokers had tried low tar cigarettes, and obviously had rejected them.

Q. Nine out of ten.

H.W. Nine out of ten. Right.

And so, our challenge was to make one, which would be good enough tasting so that they would accept them. And that's what we've done with Merit. The sales of Merit have, in the first six months, after its introduction, equalled the entire sales of all brands with less than ten milligrams in 1975.

Q. Do you think the public--those nine out of ten smokers who have tried lower tar cigarettes--are right to be worried about what the medical people tell them?

H.W. Well, now you're getting into a question of ethics. I don't know what is right, and what is wrong.

Q. Are they sensible, to heed what the medical people tell them.

H.W. Are they sensible? I don't know. Would you consider

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yourself sensible to take your doctor's advice, or would you consider yourself sensible to reject it? Let me say that there are other reasons why people may be interested in a low tar cigarette. They may just prefer something which has less impact, less taste. And I believe that there's a general trend, among American people, at least, to go to milder things. We go in for milder beer, milder food, less strong alcoholic beverages, and that sort of thing. So I would suppose-- I would hypothesize--that the trend towards low delivery cigarettes may be related to that kind of a trend.

Q. You, and your scientific colleagues, and the other American tobacco companies were advisors in the compilation of this new report by the National Cancer Institute Smoking and Health Program into less hazardous cigarettes. Isn't it reasonable to expect that you privately, if not perhaps publicly, would accept the premise on which this report was compiled, which is, and I quote:

"Cigarette smoking is a major, contributing factor in the causation of lung cancer, and chronic cardiovascular and pulmonary disease."

B.W. That's an interesting point. It came up at a discussion of the first meeting of the Tobacco Working Group Committee. The National Cancer Institute, of course, promulgated and accepted this premise, primarily to avoid a lenghty argument about whether the evidence was, or was not demonstrative of a causation effect.

We decided at that point that we would be helpful in the program, because we were concerned about the accusations and allegations that were being made, and we felt that the right thing to

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do was to carry out researches to find out more about the whole situation.

So we supported the research program.

Q. Are you saying, then, that you do not accept the premise on which the program evolved?

H.W. No. We do not accept the premise that it is proven that smoking causes these diseases.

Q. The premise says: Cigarette smoking is a major, contributing factor in the causation of lung cancer.

H.W. All right. That's another way of saying the same thing.

Q. You don't accept that?

H.W. No.

Q. Why not?

H.W. Well, I've studied the evidence a great deal. The major basis for this accusation is largely statistical. That is, epidemiological. People--if you divide the population into smokers and non-smokers, you observe that the smokers have different characteristics from the nonsmokers. One of those characteristics is the disease pattern. Other characteristics are life style, and there are very many important life style differences between smokers as a group, and nonsmokers.

Some of these life styles characteristics would conceivably be expected to lead to some of the health problems that the smokers have. So it's hard to say that cigarettes are the causative factor.

Q. It just seems strange that you and the industry would cooperate in this kind of report, if you disagreed with the fundamental

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basis of the report.

H.W. Well, in the first place, let me say that our participation was one in which the industry gave us permission to act as advisors, or consultants to the committee. In our original acceptance of the request, or invitation to become consultants, we made the point very clearly that this did not constitute an industry acceptance of this primary premise.

Q. If you are actually in the development of a low-tar cigarette, surely there must be a reason for it, other than there is an expanding market for it.

H.W. No. I think you're fishing for hidden motives and causes. We're simply in the business to make and sell cigarettes. If the public should tomorrow demand a cigarette that has twenty milligrams, we'd say: Well, smoke Marlboro. If the public should demand a cigarette that delivered five milligrams, we'd make a new product of five milligrams. I don't believe that our action in that respect constitutes an endorsement of a statement like this, which you've just read.

Q. So the public are listening more to their doctors than they are to you.

H.W. Well, I think they should on matters of health. We don't propose to advise them on matters of health.

Q. Nor, do you say to the public: don't listen to your doctors, because we believe otherwise.

H.W. I don't believe we've ever said that.

Q. And yet you disagree with the doctors.

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H.W. That's all right. I don't see anything wrong with that. I disagree with my doctor on many things. I've had a doctor tell me not to smoke. I'm essentially a nonsmoker. I smoke research cigarettes, but I'm not a habitual smoker. And yet, doctors give out this kind of advice more as a, you know, general policy, or habit, rather than on the basis of any real, intimate knowledge. The average doctor is a layman with respect to intimate knowledge in regard to Smoking and Health.

Q. But the reports which have been published over the past twenty years are not compiled by little, local doctors. They have been compiled by the leading medical authorities throughout the world.

H.W. Yes. And those people are basing their conclusions primarily on epidemiological grounds. This means, again, that they have accepted the statistical observations. But in the Surgeon-General's report, at the very beginning, they very carefully point out that statistical association does not demonstrate proof of causality.

Q. I think the world's leading medical authorities would probably argue that the evidence is much stronger than the evidence based on purely epidemiological grounds.

H.W. Right. And they will base that evidence on such things as animal experiments, which have their difficulties, as I understand it, and anecdotal data of doctors who, you know, observe patients, and things of that sort.

Q. And smokers.

H.W. Well, maybe smokers. But again, the question of causation is not one which is easily demonstrated. There's been a tremendous

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amount of medical research done, trying to demonstrate a mechanism, whereby smoking could cause a given disease, different disease; and none of these have been really definitive. This has gone on for twenty-five years. Surely, if there's a nice, clean-cut mechanism, whereby smoking causes a disease--with twenty-five years, and millions of dollars of medical research, somebody should be able to nail this thing down fairly well.

Q. But you, from your own experience, know that research is not that simple.

B.W. Agreed. Agreed. Which shows that this is maybe a very complex thing, and so you, cannot then necessarily accept the simplistic statement that smoking causes the disease.

Q. Do you believe that there are harmful components in cigarette smoking?

B.W. Let me say there are many components of cigarette smoking, and large concentrations, some of these are toxic. This is true of practically anything that we talk about in terms of composition.

For example, coffee--a high concentration of coffee certainly would not be considered a good thing. Yet, people, even people who drink many cups of coffee a day don't get into those concentrations. The definition of a harmful substance nearly always depends on circumstances, either in animal testing, or human experience, in which the concentrations are quite high. None of the things which have been found in tobacco smoke are at concentrations which can be considered harmful.

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Q. But the components themselves can be considered harmful, can they not?

H.W. Anything can be considered harmful. Apple sauce is harmful--if you get too much of it.

Q. I don't think many people are dying from apple sauce.

H.W. They're not eating that much.

Q. People are smoking a lot of cigarettes.

H.W. Well, let me say it this way. The people who eat apple sauce die. The people who eat sugar die. The people who smoke cigarettes die. Does the fact that the people who smoke cigarettes die demonstrate that smoking is the cause?

Q. The doctors would say that the people who smoke cigarettes heavily die, because they smoke cigarettes.

H.W. Right.

Q. Very few doctors would say the people who eat apple sauce die because they eat apple sauce--because they don't eat enough apple sauce.

H.W. All right. They're entitled to their opinion.

Q. Isn't that carbon monoxide in the gaseous phase of cigarette smoke? And doesn't that impair the flow of oxygen in the body, and therefore impair the function of the heart?

H.W. I've studied that carbon monoxide situation very carefully. There is carbon monoxide in smoke. But again, we have the matter of concentration. As the medical people will tell you, carbon monoxide reacts with the hemoglobin in the blood to form carboxyhemoglobin. The presence of carbonxyhemoglobin prevents that hemoglobin from carrying

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oxygen. And, of course, if a person has a large amount of carboxy-hemoglobin, then there may be a denial of oxygen to the vital tissues of the body.

On the other hand, there's a massive amount of evidence, with respect to the levels of carboxyhemoglobin in the blood of both smokers and nonsmokers, and this level is said by many many authorities to be far below... (TAPE FADE) ...

(TAPE BREAK)

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Q. I just want to take up what you're saying about life patterns and life styles.

The famous survey of British doctors done by Doll and Hill showed that amongst doctors who stopped smoking, lung cancer fell, over a period of time in which lung cancer amongst the general population increased. How do you explain that?

HW. I don't propose to explain that. I'm not familiar enough with the study.

Q. But it is one of the most famous studies ever done on Smoking and Health.

HW. Yes. I've heard of it. But I have no explanation for it. That's a medical observation that's been made. I would say that there seems to be a life style difference between people who continue smoking, and people who are quitters. That's been fairly well-established. I would classify a quitter as being more likely a nonsmoker than a smoker. Now, people quit for various reasons, of course.

Q. That's the reason why this particular survey, which is, perhaps, the world's most famous survey on Smoking and Health is so important -- because that group of doctors is a very mixed group. You're not that familiar with it.

H.W. No. I'm not. Really. I haven't studied that particular report.

Q. How can you make the assertions that you do, then about the epidemiological evidence, if you haven't studies one of the most famous reports available?

H.W. I'm not denying the epidemiological evidence. What

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I'm questioning is the cause and effect relationship, which comes from an interpretation of the epidemiological evidence. I talked to epidemiologists and statisticians, and they tell me that this does not necessarily define a cause.

For example, it's a well-established statistical relationship that when there are more people eating ice cream, there are more people drowning at the beaches. This is a very strong, statistical correlation. Would you say that eating ice cream causes drowning at the beaches?

Q. Ninety to ninety-five percent of people who die of lung cancer are cigarette smokers.

H.W. Yes. Maybe. I don't know. So you're saying that causes the disease. That's a demonstration of causation.

Q. That is the premise. That is a starting point for the medical evidence.

H.W. Yah. Sure. What statistical and epidemiological studies do is point to directions in which medical research should go to further define the relationship between causation and disease.

Q. What is tar?

H.W. Tar is defined by the dictionary as a dark, brown, oily liquid. It's unknown composition. There are many kinds of tar. There is coal tar, petroleum tar, tar in sands, and, of course, there's cigarette tar. The term cigarette tar arose because the concentrate from the cigarette smoke, that is, the material which could be collected from it in a flask appeared to be a dark, brown, oily liquid -- and for want of a better name, the

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individuals who were trying to characterize this, called it a tar.

Q. Do you believe there are carcinogenic substances in tar?

B.W. Well, let me answer that, by starting out by saying that a carcinogenic substance is one which, when applied to a test animal, ultimately gives rise to a malignant tumor. There are substances in cigarette smoke, as well as in many other substances, mixtures to which we're exposed, which, when applied in large quantities to test animals under certain circumstances are said by the medical researchers to give rise to malignant tumors.

Q. So, you do believe that there are carcinogenic substances.

B.W. The question of belief sounds like a question of religion.

Q. But you analyze these substances.

B.W. Right.

Q. Day after day, year after year. You know what is in them.

B.W. All right. I'll tell you. I'm puzzled by the data. For example, it has been shown that a substance called benzoate pyrene is in cigarette smoke. The people of the American Cancer Society, Drs. Hammond and Silikoff, went out and examined the health patterns of roofing workers in Chicago, who were exposed, during their daily work, of applying petroleum tars to roofs, for the purpose of waterproofing -- to more than a thousand times as much as a two pack a day smoker with cancer. And they studied these people over a long period of time. These people did not

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demonstrate a higher rate of lung cancer than the general population. How do you explain that?

Q. Were they smokers?

H.W. It didn't make any difference whether they were smokers, or not smokers, they were being exposed to a very high level of this substance, which is said to be a carcinogen, and yet, they didn't exhibit any increased rate of disease.

Q. The World Health Report says that tar contains many carcinogens, of which polycyclic hydrocarbons are the most important. Do you agree with that?

H.W. Do I agree with the statement, or do I agree with the report?

Q. With the statement, and the report.

H.W. There are polycyclic hydrocarbons in smoke.

Q. And they are carcinogenic.

H.W. Under certain circumstances with test animals, some have been identified as so-called carcinogens.

Q. The W.H.O. Report goes on to say there are also other carcinogens, such as nitrosamines, beta-naphthalamines. There's also a wide variety of irritants, like etroline, nitric oxide, and nitrogen dioxide, and co-carcinogens, including cresol (?) and phenol (?). Do your researches show otherwise?

H.W. No.

Q. You'd agree with it?

H.W. I agree that there's a great deal of literature which indicates that some of these substances are in smoke.

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Q. And your own research shows this.

H.W. In some cases. We have not examined all of these.

Q. Can you say that cigarettes do no harm to the cigarette smoker?

H.W. I'm not in a position to say that. I don't know what harms the cigarette smoker, or what doesn't harm you. I really honestly don't know that. You must be trying to get me to admit that cigarette smoking is harmful.

Q. No. I'm just interested, because you were, for many years, Director of Research here. You have, perhaps more than many others, analyzed the cigarettes and the chemical components of the cigarette, and that must lead you to certain conclusions one way or the other. I'm just interested in what those conclusions are. Are they harmful, or are they not?

H.W. You must read more of the literature on the decision of what is harmful, and you will discover there that what we're talking about are the quantities to which the individual is exposed. Things which are not harmful under certain conditions are harmful under other conditions. Let's take a patient with arthritis, maybe taking as much as a hundred grains of aspirin a day. Considerably more aspirin would be fatal.

Q. So, it's a question of degree. Doctors would say that a person, who, say, smokes five cigarettes a day doesn't run much of a risk -- that the risk you run is in direct proportion to the amount of cigarettes you smoke. That is the question of degree.

H.W. Dr. Gorey himself of the National Cancer Institute has

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recently said that a hundred milligrams of tar is probably harmless.

Q. Depending on how many cigarettes you smoke.

H.W. A hundred milligrams of tar from cigarette smoking. What he's saying, in effect is you can smoke more of a low tar cigarette than a high tar cigarette.

Q. Why don't --

H.W. I don't know whether he meant to say that, or not, but that's what he said.

Q. Why don't you smoke, Dr. Wakeham?

H.W. Well, let me say, first place, I tried smoking as a young man, a boy, and it didn't particularly appeal to me. I was not in the cigarette business for the first twenty years of my professional career. When I came with Philip Morris, of course, as other employees, I had all the free cigarettes I wanted. Smoking doesn't do anything for me. I believe that the fifty-six million smokers in this country perceive some benefit from smoking, and that's why they smoke. I don't believe they're, you know, hooked on it, in the sense that they're addicted to it. They get pleasure out of it, just as some people get pleasure out of drinking coffee, or drinking alcohol, or sex, or all the other things that people do, to help them get through life.

Q. Do they suffer any harmful effects, to counteract the pleasure that the product gives them?

H.W. Well, you know, all the things in life that are fun are bad. That's a sort of an ethical belief. I don't know whether they suffer harmful effects, or not, from drinking coffee, or sex, or alcohol.

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Q. Some bad things, perhaps, do you more harm than others.

H.W. Possibly. My admonition would be: All things in moderation.

Q. What's moderation?

H.W. That depends on the individual. Again. People vary in their ability to cope with the stresses of life. Some people need more help than others.

Q. If I'm a smoker, and say, I know you personally, in other words, you do, and I come to you, and say: "Look, Doctor, I'm a bit worried about what people are saying about smoking, and health. Should I carry on smoking? What would you say to me?"

H.W. I would say that I'm not really competent to advise you with regard to whether or not smoking is or is not harmful to you. I would say that if you feel that anything you're doing is harmful, you have to decide whether the benefits outweigh the risks. And if the benefits don't outweigh the risks, well then, give it up. Or, at least, moderate it.

Q. Or, smoke Merit.

H.W. Or, smoke Merit. Smoke a cigarette which delivers less. That is, assuming the dose/response relationship, which the medical people tell us, is valid in this case.

Q. Because it will do me less harm?

H.W. For whatever reason.

Q. Medical reason.

H.W. I won't say it does you less harm, because I really don't know that. If you believe the one hit theory of cancer causation, then one puff in a lifetime is enough to trigger disease. I don't

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believe that. I smoke cigarettes, maybe one, or two, or three a day, as a researcher.

Q. We're not talking about one puff causation, Doctor. The doctors aren't talking about one puff causation.

H.W. Some are.

Q. Not many.

H.W. Well, all right. Now, we get into number statistics.

Q. They're talking about degree. They're talking about dosage. They're talking about the number of cigarettes smoked a day, the number of years smoked, and the effect that that has on the individual. They're not talking about one puff causation.

H.W. So?

That's their opinion.

Q. As a past President of the Boy Scouts of America --

H.W. Of a local Council.

Q. As a person who's been closely connected with the Boy Scout movement --

H.W. Right.

Q. Would you advise young people to smoke?

H.W. No. I don't give out advice like that under any circumstances, even with my own children. I tell my children that it's up to them to develop their own life style. And, of course, maybe I've even been more radical. Before I ever got seriously involved in the tobacco business, I told my children, who were very young, that it was up to them to decide whether or not they would take up things like smoking. I think they all tried it. Actually, none of them are smokers. Maybe that's a case of parental example.

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Q. Do you have any worries at all about the product that your company makes, or the product that the American cigarette manufacturers make?

H.W. Well, are you raising an ethical question?

Q. Yes.

H.W. In other words, am I worried about the ethics of whether or not the company, like Philip Morris, should make cigarettes, and sell them?

Q. In the light of what the doctors keep telling you. Yes.

H.W. I think that if the company as a whole believed that cigarettes were really harmful, we would not be in the business. But we're a very moralistic company. I think the management of Philip Morris is sincere in this position. I think there's a great deal of doubt as to whether or not cigarettes are harmful. If you read both sides, not only the point of view of the people who have missionary zeal to make the world stop smoking, but the people who are trying to be objective with respect to this question, you will discover there's a great deal of doubt with regard to whether or not smoking causes all these diseases, which are alleged to be caused by smoking.

Q. The W.H.O. Report was compiled by the leading medical and scientific authorities an the field throughout the world. Do you seriously question what they say?

H.W. I haven't read the report that thoroughly.

Q. But shouldn't you --

H.W. Well, I'm generally aware of it. I'm also aware of the fact that most of the people who are involved in the assertions,

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with respect to Smoking and Health were people who had made in many cases what I would consider extreme statements on the subject. After all, they're dedicated to the question of improving the health of people, and so they're apt to be very conservative in this respect. You wouldn't really expect the W.H.O. to come out, and say that drinking is healthy, anymore than you would expect them to come out, and say that smoking is healthy.

Q. Unless they believed that it was, and they apparently don't.

H.W. Yes.

Q. Because the evidence that they've amassed --

H.W. And now we discover that there are all kinds of things that are unhealthy...

Q. Of which, cigarettes, they say, are one of them.

H.W. Cigarettes are one. But what are we to do? Stop living? The best way to avoid dying is not to be born, you know. And if one avoided doing all the things which are alleged to be harmful to people, these things -- we would vegetate in a mountain cave. We can't subject ourselves to that kind of a situation, and as a result of that, I think what we have to do is recognize that people are constantly being exposed to various kinds of risks, and we have to balance those risks against the benefits. The benefits may be perceived, they may be evaluated in dollars and cents. They may be psychological. But nevertheless, to the person who is involved, they're real.

Q. Do you think the benefits of cigarette smoking outweigh the risks?

H.W. Are you expecting me to now balance the equation, to

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decide what the benefit is, and what the risk is?

Q. It is something...

H.W. You can't do that very effectively. If a person finds that he can cope with the stresses of life better by engaging in some kind of activity, and he feels more pleasure and enjoyment and ability to get along with the world, by engaging in that activity -- the benefits to him may be very real, and very important, and he may say: "Well, all right. I've heard from the medical people that there may be some risks. But I'm willing to accept those risks in order to achieve the benefits."

A man crossing the street against a red traffic light knows there's a risk, that he may be clipped by an automobile, and so he'll wait, until the light changes to green, in which he has less of a hazard in crossing. On the other hand, if he's crossing the street, in a hurry to catch an airplane for an important business appointment, he may take that risk, despite the fact that the light is red, and automobiles are whizzing by.

Q. But if he sees a car coming, he's not likely to cross the street.

H.W. Right. At least, if he's prudent, he wouldn't. He may at least try to dodge it.

Q. You make it sound a risky business.

HW: I make it sound a risky business. Life is risky.

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UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

ELLIS SIMON; TRUDY HUNT; TONY YOUNANY; GEORGE OKO; JACQUELINE HOUNCHELL; SYLVIA WOHL; LARRY ABBOTT; ESTATE OF GEORGE PATTERSON; ESTATE OF WILLIE GRIER; ESTATE OF JOYCE FOGLIANO; ESTATE OF VIRGINIA OVERSTREET; ESTATE OF EVELYN SCHREIBER; ESTATE OF ROBERT ENGLAND; and ESTATE OF STANLEY KESSELMAN, on behalf of themselves and all other persons similarly situated,
Plaintiffs,

v.

PHILIP MORRIS INCORPORATED; R.J. REYNOLDS TOBACCO COMPANY; BROWN AND WILLIAMSON TOBACCO CORPORATION; B.A.T. INDUSTRIES, P.L.C.; THE AMERICAN TOBACCO COMPANY; LORILLARD TOBACCO COMPANY, INC.; and LIGGETT & MYERS, INC.,
Defendants.

Case No. 99 Civ. 1988 (JBW) (SMG)
November 29, 1999

ANSWER OF DEFENDANT PHILIP MORRIS INCORPORATED TO PLAINTIFFS' FIRST AMENDED CLASS ACTION COMPLAINT

Excerpt

29. Philip Morris admits that smoking is a risk factor for, and may in fact cause, certain kinds of diseases in humans, but states that **it has not been scientifically established whether cigarette smoking causes any of these diseases in humans**. Philip Morris further states that **no constituent or group of constituents of cigarettes smoke in the quantities found in cigarette smoke has been established to cause lung cancer in humans**. Philip Morris denies the remaining allegations of Paragraph 29.

30. Philip Morris admits that the CDC have estimated the number of people who die each year from illnesses allegedly attributable to smoking, but Philip Morris denies the truth and accuracy of those estimates. Philip Morris denies the remaining allegations of Paragraph 30.

31. Philip Morris admits that cigarettes contain nicotine and that nicotine occurs naturally in tobacco. In response to the allegations of Paragraph 31, Philip Morris states that whether a substance or activity is "addictive" depends entirely on how the term "addiction" is defined. Philip Morris recognizes that under widely used, current

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definitions of the term "addictive," nicotine and/or smoking may be considered "addictive." However, the term has meant different things to different people at different times and has both scientific and colloquial meanings. For example, in 1964 the United States Surgeon General defined an "addiction" as a "state of periodic or chronic intoxication produced by the repeated consumption of a drug (natural or synthetic)." Using this definition, the Surgeon General concluded that nicotine was not "addictive." In 1988, the Surgeon General applied a wholly different and far more expansive definition and concluded that nicotine was "addictive." That term is now often used indiscriminately and is applied to such substances as caffeine and such activities as shopping and Internet use. If the term "addiction" is defined using objective, scientifically verifiable pharmacological criteria, including (1) meaningful intoxication; (2) physical dependence that is manifested by a significant withdrawal syndrome; and (3) tolerance to intoxicating effects, Philip Morris states that nicotine is not "addictive."

Philip Morris denies allegations in Paragraph 31 of the Complaint to the extent that the term "addictive" is used to describe or include the psychotoxic and behavioral effects of heroin, cocaine or other drugs of abuse. Numerous studies have shown the effects of nicotine and/or smoking are not similar to those of heroin, cocaine or other drugs of abuse. Philip Morris also denies the allegations to the extent that the term "addictive" is used to mean that smokers cannot quit smoking if they decide to do so. Although Philip Morris recognizes that for some smokers it can be difficult to quit smoking, millions of smokers have quit. As the Surgeon General has recognized, nearly half of all living adults who have ever smoked have quit and 90% have done so without any professional assistance. Philip Morris denies the remaining allegations of Paragraph 31.

32. **Philip Morris states that nicotine in cigarettes is not "addictive" under objective, scientifically verifiable pharmacological criteria used to define that term** . Further answering, Philip Morris admits that cigarette smoking is a risk factor for, and may in fact cause, certain kinds of diseases in humans, but states that **it has not been scientifically established whether cigarette smoking causes any of these diseases in humans** . Philip Morris further states that Plaintiffs have failed to define, and the scientific community has been unable to achieve a consensus on, what constitutes a "safer" cigarette. Philip Morris admits that Plaintiffs purport to quote from Philip Morris' web site, launched on October 13, 1999, but denies that this language is quoted in context or in its entirety, denies Plaintiffs' characterization of this language, and denies Plaintiffs' innuendo and implication regarding the content or meaning of this language. Philip Morris incorporates by reference its response to Paragraph 31 as though

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fully set forth herein. Philip Morris denies the remaining allegations of Paragraph 32.

[emphasis added]

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PHILIP MORRIS U.S.A.
PHILIP MORRIS INTERNATIONAL
TOBACCO ISSUES
Youth Smoking Prevention
Health Issues for Smokers
Quitting Smoking
Ingredients in Cigarettes
Secondhand Smoke

Cigarette Marketing Practices

THE RULES AND BELIEFS THAT GUIDE US IN THE MARKETING OF OUR PRODUCTS

- Philip Morris markets its cigarettes only to adults who choose to smoke. This means that we *don't* direct our marketing or promotional efforts towards minors. We fully recognize, however, that it is often difficult to market a product in a way that is simultaneously appealing to a smoker of legal age, and unattractive to an underage smoker. This is one reason that, as a responsible marketer of a legal product intended only for adults, we *voluntarily* adhere to marketing codes.

  Click here to see information about Philip Morris U.S.A.'s marketing practices.
  Click here to see information about Philip Morris International's marketing practices.

- In addition to these voluntary efforts, there are significant legal restrictions on cigarette marketing throughout the world. Many governments have focused substantial energies and efforts on this topic.

  Click here for information about the marketing restrictions contained in the U.S. Master Settlement Agreement.
  Click here for a summary of significant international restrictions.

- We support laws mandating a minimum age for the purchase of cigarettes everywhere we do business. In addition, because many regulators and members of the public believe that *any* marketing - even the restricted marketing permitted by our codes - influences a child's decision to smoke, we make efforts to address these views and seek common ground on this issue. Our goal in every market where we do business is to stay in step with public opinion and expectations with respect to this important topic. Whether this goal is achieved through a voluntary industry agreement or through legislation, we seek a level playing field on which we can communicate to adult smokers, and fairly compete with other manufacturers.

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Click below for a few articles about the effect of cigarette marketing on smoking prevalence:

- From the American Medical Association
- From the U.S. Food and Drug Administration
- Analysis of the impact of advertising bans on tobacco consumption

Click here for references to general material about the effects of marketing on brand choice.

- Although we intend our marketing to influence brand choice by adult smokers, minors who decide to use a product - including cigarettes - appear to gravitate towards the brands that are most popular with adults. We do not accept the idea that the popularity of any of our brands among underage smokers suggests in any way that we have been marketing to minors. We think that the critical challenge is to reduce the *total* number of children who smoke *any* brand. That is what we should all focus on.

Click here for information about Philip Morris' youth smoking prevention efforts.
Click here for information about underage brand preferences in the U.S.

Click here for our policy regarding links.

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PHILIP MORRIS U.S.A.
PHILIP MORRIS INTERNATIONAL
TOBACCO ISSUES
Youth Smoking Prevention
Cigarette Marketing Practices
Health Issues for Smokers
Quitting Smoking
Ingredients in Cigarettes
Understanding Tar and Nicotine Numbers
Secondhand Smoke

Quitting Smoking

IF YOU WANT TO QUIT, THINGS TO KNOW

One of the required cigarette warnings for packages and advertisements in the U.S. is "SURGEON GENERAL'S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health." **To reduce the health risks of smoking, the best thing to do is to quit; public health authorities do not endorse either smoking fewer cigarettes or switching to lower-yield brands as a satisfactory way of reducing risk.** If you want more information:

Click here to read a summary of "The Health Benefits of Smoking Cessation: A Report of the Surgeon General".
Click here to read information about the effects of quitting from the National Cancer Institute.
Click here for information about health issues for smokers.

For a discussion of the relative riskiness of lower-yield brands:
- View some analysis from the U.S. Department of Health
- View excerpts from the United Kingdom's Scientific Committee on Tobacco and Health
- View an article by tobacco control advocates
- View information from the government of British Columbia's (Canada) Ministry of Health

It can be difficult to quit smoking, and many smokers who try to quit do not succeed. Millions of smokers in the United States and around the world have succeeded, though - most without outside assistance. As stated on drkoop.com, "[t]here's only one way to change your tobacco habit: You have to do it yourself, your way." If you want to see more information:

Click here for information relating to addiction and quitting from the U.S. Centers for Disease Control

For those smokers who want to quit but are having difficulty, there are many programs and products marketed as being helpful, including group classes,

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hypnosis, nicotine replacement therapies and smoking deterrents. The U.S. Surgeon General has said that "[s]moking cessation researchers have long recognized smoking to be a complex behavior influenced by physiological, psychological, cognitive and social factors. In general, most cessation treatments yield 1-year quit rates (based on all original participants) between 10 and 40 percent." If you want to quit and believe that outside assistance would be helpful, we encourage you to investigate the wide selection of options that are available, and see if there are any that seem right for you.

Click here to see highlights of the 1989 Surgeon General's Report.

Below, we're providing for your convenience links to sources of information about quitting smoking.

Visit Quitnet.org

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>OUR RESPONSIBILITY
Responsible Marketing
Youth Access Prevention
Master Settlement Agreement
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Charitable Giving
Community Development
Grant Information
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Employee Volunteers
Youth Smoking Prevention
Communication
Education
Community Action
Access Prevention
Expert Quotes
The Environment
Litter
GOVERNMENTAL ISSUES

Our Responsibility

We are more than 13,000 people working across the United States and five U.S. territories with one, overriding mission: to be the most responsible, effective and respected developer, manufacturer and marketer of consumer products made for adults. Our core business is manufacturing the best quality tobacco products available to adults who choose to use them.

To accomplish this, we rely on a set of core values to guide us:

First, we believe in operating with integrity, trust, and respect, both as individuals and as a company.

This means we conduct ourselves within both the spirit and the letter of the law, regulations, agreements and policies that govern us. We are honest with one another and with our stakeholders, fully disclosing all appropriate information, and not just that which supports our point of view. We have the courage to do what's right.

Second, we demonstrate a passion to succeed in every aspect of our business.

This means we bring optimism, initiative and dedication to our work, displaying confidence in our ability to succeed. We continually raise our expectations for what is possible, and encourage a constructive dissatisfaction with our results. We apply our learnings to the future, using both our successes and our disappointments as stepping stones to continued success.

Third, we believe in executing with quality, by understanding and responding to our adult consumers' preferences.

This means we plan collaboratively to ensure consistent and achievable goals. We execute by saying what we will do, doing what we say, and documenting the results. We establish clear accountabilities and strive to produce superior results for our shareholder.

Fourth, we believe in driving creativity into everything we do, resulting in innovation and continuous improvement for our adult consumers and our business processes.

This means we encourage everyone to think about things differently and to think about different things, bringing vigorous challenge to everything we do. We build and develop ideas through collaborative leadership and by fully utilizing the unique talents within our company. We are receptive to new ideas, and applaud those who dare to think differently.

And finally, we believe in sharing with others, unleashing

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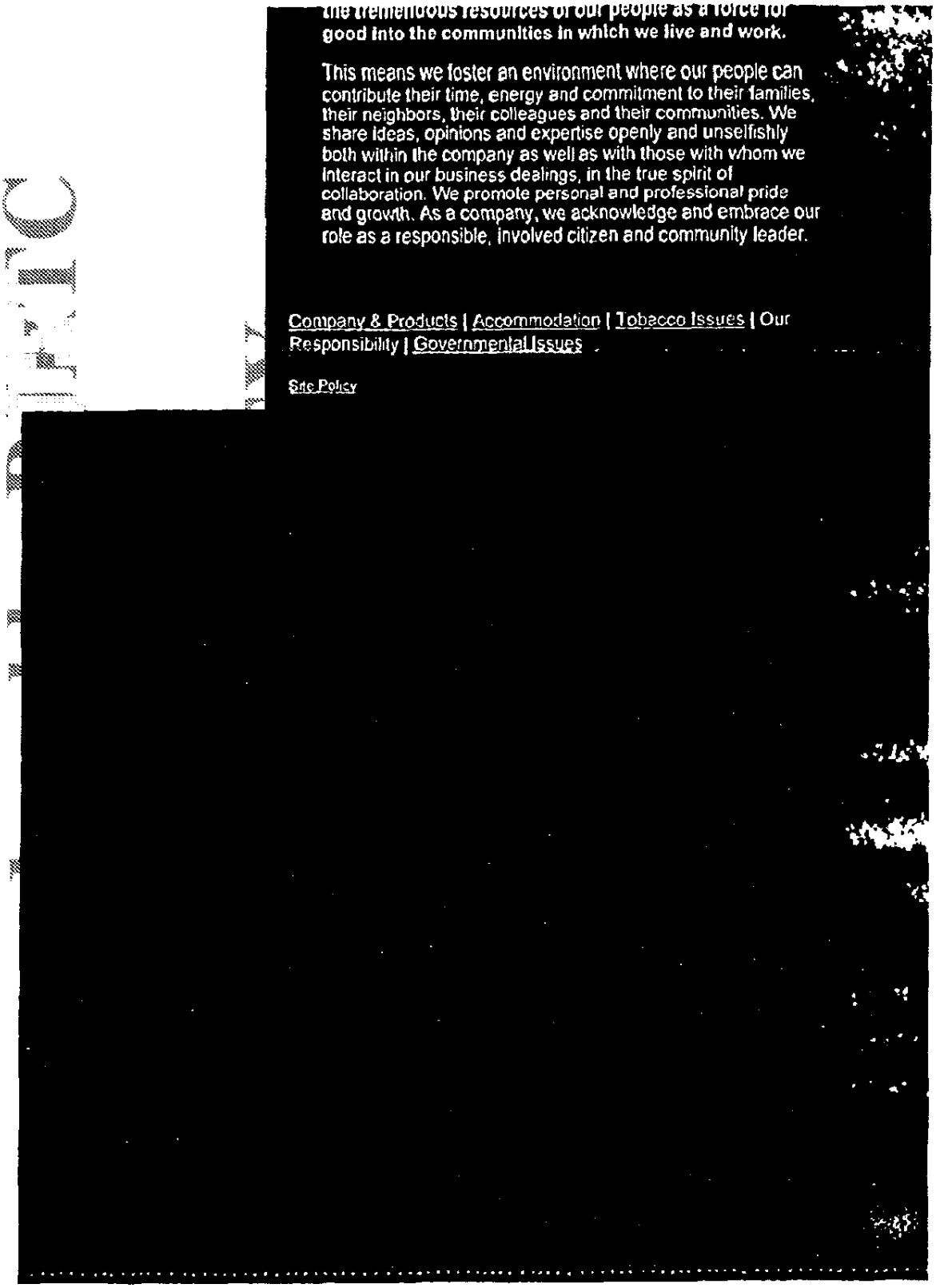

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PHILIP MORRIS U.S.A.

HOME
COMPANY & PRODUCTS
>Ingredients In Cigarettes
Tar & Nicotine Numbers
Our Facilities
Our History
Careers
Company News
Contact Information
ACCOMMODATION
TOBACCO ISSUES
OUR RESPONSIBILITY
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Ingredients In Cigarettes

What Is In Our Brands?

The major component of each of our cigarette brands is tobacco. In fact, our typical American blended cigarette contains at least 90% tobacco in the "filler" portion (i.e., the column above the filter). If you want to learn more about tobacco used in cigarettes:

Information from the U.S. Department of Agriculture.

Besides tobacco, our cigarettes contain a variety of additional ingredients. Since 1986, the manufacturers of cigarettes sold in the U.S. have disclosed all of the ingredients added by those manufacturers to the tobacco in their products to the U.S. Department of Health and Human Services. Other disclosures have been made internationally, and governments in many countries have enacted regulations relating to cigarette ingredients. Philip Morris supports the idea that governments should be able to monitor the use of ingredients in cigarettes, as they do for other consumer products, with the same confidential treatment of trade secrets. If you want to learn more about cigarette ingredients and how they are regulated:

A description of ingredients information on this site and ingredients regulation.

Ingredients in PM USA's brands.

In addition to the "tobacco rod" (the column of tobacco in each cigarette), the cigarette is constructed from materials and components we purchase from independent suppliers – such as cigarette paper and filter materials. We have provided a description of some of these components on this site.

Government health warnings about smoking apply to *all* cigarettes, regardless of the ingredients added, including those containing only tobacco and paper. In fact, the U.S. Federal Trade Commission's Director of Consumer Protection has recently taken action to "clear up any misconception that cigarettes without additives are safer to smoke than other cigarettes." According to an FTC press release, "Frankly, there's no such thing as a 'Safe Smoke'."

Information about health issues for smokers.

FTC's 1999 press release on cigarette ingredients.

Ingredients Information and Regulation

Smokers of many Philip Morris USA brands of cigarettes can find a list of some of the ingredients used in their cigarettes by accessing brand names in What's in my brand?

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Ingredients Added to the Tobacco

For each individual brand list that appears on this site, we have listed the tobacco and the ingredients added to the tobacco, with two types of exceptions. The first is ingredients such as processing aids, which are not significantly present in, and do not functionally affect, the finished cigarette or the smoke inhaled by consumers.

The second exception is flavors, which provide each brand with its own unique flavor, taste and aroma. These are grouped together and listed as flavors - as is the practice in the food industry in many countries. Flavors typically make up less than 1.5% of the finished cigarette by weight

The identity, combination and amounts of flavors used in individual brands are highly valuable proprietary trade secret information belonging to Philip Morris. Their public disclosure would provide our competitors with a competitive advantage and cause significant commercial damage to our tobacco companies.

We have devoted a significant amount of time, effort and money to developing and improving flavor combinations for our products. We want to be the only company that can offer a cigarette that tastes exactly like any of our quality brands.

A U.S. federal appeals court recently agreed with us:

Because consumers choose brands based on flavor, taste and aroma, and tend to remain loyal to those brands, small fortunes are spent creating flavor formulas for tobacco products. The information needed to copy these formulas is, in turn, worth many millions of dollars...It is no secret that tobacco companies, like other manufacturers of brand name products, employ elaborate procedures to safeguard their ingredient information.

Click here for full opinion of the court.

Do we provide anyone with information about the processing aids and flavors in our cigarettes? Yes. Each year, for example, the manufacturers of cigarettes sold in the U.S. disclose all of the ingredients added by those manufacturers to the tobacco in their products to the U.S. Department of Health and Human Services. Read the 1994 list submitted to HHS and subsequently released to the public. The composite industry list contains each of the flavors added to our cigarettes in the preceding year. Thus, while we do not disclose on this web site the specific flavorings used in specific brands, PM USA provides HHS with disclosure of all ingredients added to tobacco as required by the U.S. Congress.

Other countries have their own cigarette ingredients regulations. For example, composite industry lists (similar to the one described above) have been disclosed in Chile and New Zealand. In other countries, including Thailand and Ireland, by-brand disclosures of certain ingredients have been made to the government, subject to trade secret protections. In a number of countries, including Germany, the government publishes lists of ingredients that are either expressly permitted, or prohibited, for addition to tobacco in cigarettes.

Philip Morris supports the idea that governments should be able to

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monitor the use of ingredients in cigarettes, as they do for other consumer products, with the same confidential treatment of trade secrets.

Ingredients In the Rest of the Cigarette

In addition to the "tobacco rod" (the column of tobacco in each cigarette), the cigarette is constructed from materials and components we purchase from independent suppliers – such as cigarette paper and filter materials.

For some of these components, we have provided a description of the component rather than a list of individual ingredients.

Read our policy regarding links

Ingredients in Cigarettes | Tar & Nicotine Numbers | Our Facilities | Our History | Careers | Company News | Contact Information

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Philip Morris Companies Inc. PHILIP MORRIS SIT

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Quality tobacco products, responsibly marketed.

The companies Philip Morris U.S.A. and Philip Morris International together represent the core tobacco business of Philip Morris Companies Inc. With products sold in over 180 markets worldwide, we are the world's leading tobacco company. We are committed to responsibly manufacturing and marketing the world's best known and highest quality cigarettes. In 1998 one out of every six cigarettes sold worldwide was a Philip Morris brand.

As members of the Philip Morris family of companies, we feel a strong sense of commitment and responsibility to the communities where our employees live and work. Our goal is to meet and exceed society's diverse expectations of us on the many issues that face our company and our industry, including our support, development and implementation of youth smoking prevention initiatives worldwide, and our continuing efforts to accommodate the preferences of non-smokers and smokers alike in public places.

If you would like to learn more about our tobacco businesses, please click on the links above. To learn more about tobacco-related issues, click on the link to your left.

We are very proud of our cigarette brands and the advertising campaigns that have supported them over the years. However, this site is meant to share information about our company, our issues and our programs. Therefore, we have not included any brand imagery because it is not our intention to market, advertise or promote our cigarette brands on this site.

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HOME
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Ventilation
TOBACCO ISSUES
OUR RESPONSIBILITY
GOVERNMENTAL ISSUES

'Accommodation'

Accommodation. That's the key word that sums up our approach to working to resolve differences between smokers and non-smokers.

Public Place Smoking

We believe that everyone's choices should be respected when it comes to the issue of smoking in public places. Many non-smokers find environmental tobacco smoke, often called "secondhand smoke," annoying. Others have concerns about reported health risks. Therefore, we believe non-smokers should be able to expect an environment in which smoke and odor do not bother them.

At the same time, adults who choose to smoke should be able to do so in a pleasant and comfortable environment. And business owners should be able to choose the smoking policy that best suits the needs of their business and the preferences of their customers and employees.

Public policies that mandate all-out smoking bans neither respect these choices nor achieve balance for non-smokers, smokers and business owners. Smoking bans are not a reasonable solution, and they can result in negative social and economic impact for businesses, employees and customers. We support reasonable regulatory measures that take everyone's preferences into account. However, we believe business owners are in the best position to determine the appropriate policy for their business and should be given flexibility in deciding what works for them and their customers and employees.

We believe that there are many options for a variety of circumstances that can provide comfort for both non-smokers and smokers in a balanced way: Ventilation improvements. Separate areas. Separate rooms. And sometimes no separation at all.

By working together, we believe we can make a difference in finding balance and comfort for both non-smokers and smokers. That's why we are implementing a national initiative called "Options." Its mission is to help business owners, public policy makers and the general public find effective ways to accommodate everyone's preferences – non-smokers and smokers alike.

The Benefits of Accommodating Both Non-Smokers and Smokers

More than three quarters of Americans believe "smoking or non-smoking" is a choice customers should be offered when entering a restaurant or hotel, according to a national survey commissioned by the Distinguished Restaurants of North America (DRNA), conducted by Roper Starch Worldwide (June 1998) and funded with a grant from Philip Morris U.S.A.

The survey polled more than a thousand adults from across the country and found that 77 percent of the American public agrees

Philip Morris Inc. Printed in U.S.A.

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that "we should find a way to accommodate both smokers and non-smokers in hospitality establishments."

Similarly, a 1999 poll of bar patrons sponsored by the National Licensed Beverage Association and funded by Philip Morris U.S.A. found that 64 percent of respondents believe non-smoking and smoking choices should be accommodated in bars. Both polls found nearly 80 percent of the public agrees that ventilation can have an impact on resolving public place smoking issues.

The DRNA survey also found that:

- 89 percent agree that those who choose to smoke and those who do not should respect each other's choices
- 75 percent believe that smoking issues can be resolved through common courtesy
- 54 percent believe smoking should be allowed in designated areas of restaurants
- 61 percent said that smoking should be allowed in designated hotel rooms

Business Owners' Right to Choose

When it comes to who should be primarily responsible for setting smoking policies in hospitality establishments, the DRNA survey found that 55 percent of Americans believe that business owners should decide. A further 22 percent believe customers should have this responsibility, while only 19 percent would put the decision in the hands of the government.

Many hospitality associations have come out against government-mandated smoking bans, having found that bans can have a significant and negative impact on a business's bottom line. Two months after a smoking ban went into effect in California, over 59 percent of bar owners reported a decrease in sales; stand-alone bars were hit with an average decrease of over 81 percent, according to a 1998 poll conducted for the American Beverage Institute.

To demonstrate that there are viable options to smoking bans, hospitality associations are exploring reasonable ways to accommodate all customers. Industry members are teaming up with indoor air quality experts — including heating, ventilation, and air-conditioning (HVAC) manufacturers and contractors — to look into cost-effective, efficient ways to create pleasant and welcoming environments.

Working to provide accommodating environments and to find reasonable options to smoking bans has become a priority for many hospitality businesses, and for good reason: Every restaurant, hotel, bar, and bowling center wants to attract and keep as many customers as possible.

Government Regulation and the Impact of Bans

Studies confirm that restrictive smoking bans can result in a negative economic and social impact.

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According to recent surveys of managers and patrons in the city of Boston, the imposition of severe smoking restrictions has already reduced patronage there. The study, commissioned by the International Society of Restaurant Association Executives and funded with a grant from Philip Morris U.S.A., found that the restaurant industry in Boston could potentially lose an estimated $40 million as more patrons frequent ban-free towns outside of Boston.

Last year, the American Beverage Institute conducted a telephone survey of 300 owners and managers of California establishments that serve beverage alcohol, many of which were affected by the January 1, 1998, statewide smoking ban. The results indicate that the majority of establishments, 59.3 percent, experienced a decrease in business since the ban went into effect; while 30.3% experienced no effect; 6.7% experienced an increase in business; and 3.7% refused to answer or did not know.

The bottom line is that reasonable options that accommodate everyone's preferences and provide comfort and balance for customers and employees are better than outright smoking bans. The final choice should rest with the marketplace, allowing business owners to have the flexibility to accommodate everyone.

Company & Products | Accommodation | Tobacco Issues | Our Responsibility | Governmental Issues

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PHILIP MORRIS INC

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Everything for People Concerned About Smoking & Nonsmokers' Rights
FIRST on the Internet for Smoking News and Documents

Action on Smoking and Health

A National Legal-Action Antismoking Organization
Entirely Supported by Tax-Deductible Contributions

Info About ASH | ash.org | To Join ASH

The PM Web Circus [10/29-2]

Excerpts from **TOBACCO CONTINUES ITS WEB OF DECEIT**

By Derrick Jackson, The Boston Globe appearing in Chicago Tribune [10/29/99]

Philip Morris is playing us all for Bozos. The cigarette-maker has unveiled a new Web page that, after decades of denials and lies, admitted that the company's product might cause a few problems for consumers, like, um, cancer. Given the denials and lies, David Kessler, the former head of the Food and Drug Administration who bludgeoned the tobacco industry at every chance, called Philip Morris' move a "profound change."

Aside from curious reporters and anti-smoking advocates who will get chuckles from this Web site, it is difficult to imagine who else would actually use it. It is hard to see a chain smoker buying a discount pack at the gas station and rushing to the Internet to read: "There is an overwhelming medical and scientific consensus that cigarette smoking causes lung cancer, heart disease, emphysema and other serious diseases in smokers."

It is just as unlikely that underage smokers are going to bum a Marlboro off a buddy at the corner store, then go home to stare at a computer screen that says, "Click here for information about Philip Morris USA's Youth Smoking Program department."

Most health-conscious people do not need Philip Morris to hot link them to the surgeon general's report, the World Health Organization or the American Cancer Society.

There is only one reason Philip Morris has the Web site. It is not to inform smokers but to insulate the company from further attack from dying smokers.

Big Tobacco negotiated a $246 billion settlement with the states who sued to recover the cost of treating ill or dying smokers. But it still faces suits from the federal government, individuals and health insurers who say that cigarette-makers knew for decades how deadly their products are.

Philip Morris evidently hopes that if it comes just clean enough--it does not come out and say smoking causes cancer, it only acknowledges the "overwhelming evidence" that it does--it will convince juries that smokers were fully informed of the dangers of cigarettes and thus gave themselves cancer.

Philip Morris is gambling that it can seduce juries to forget that today's plaintiffs began smoking in yesterday's era of denial and lies.

Fearing just that, attorneys for 500,000 Florida smokers have already asked a judge to shut down the Web page. In July a Miami jury found Big Tobacco liable for smoking-related illness. The big-money, damage phase of the trial begins Nov. 1.

Shutting down Web sites is highly impractical on the basis of free speech. But the episode makes it clear why Philip Morris has the Web site. Philip Morris knows that few people will use it as a hot link to the American Cancer Society. What they are doing is finding a new way to avoid having any responsibility for cancer.

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click here to return to ASH's Home Web Page: http://ash.org
click here for more information about Action on Smoking and Health (ASH)
click here to learn the many benefits of joining ASH on-line, over the Internet

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DEPOSITION EXHIBIT

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DEPONENT: RICHARD A. CARCHMAN

DATE: MARCH 28, 2001

CASE NAME: EZELL THOMAS

EXHIBIT NO.: EXHIBIT 6

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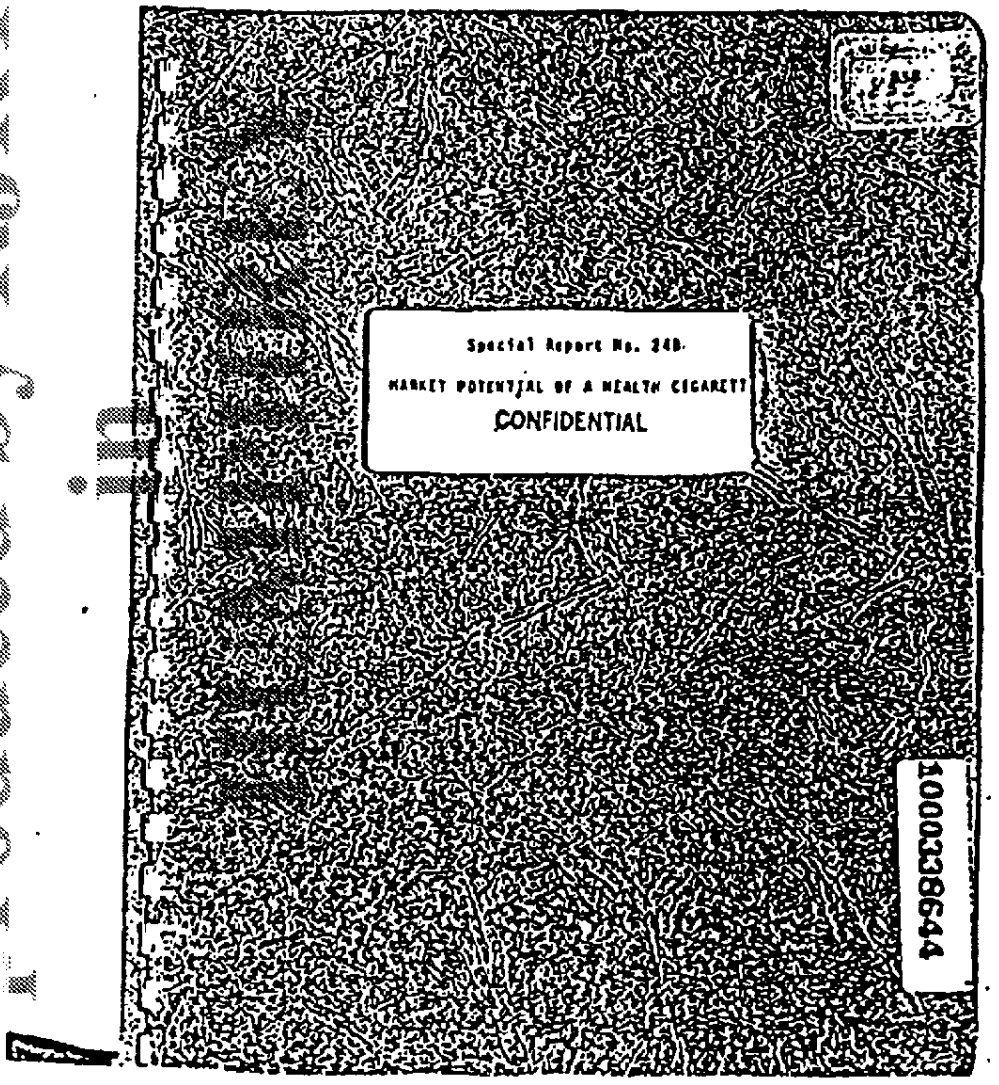

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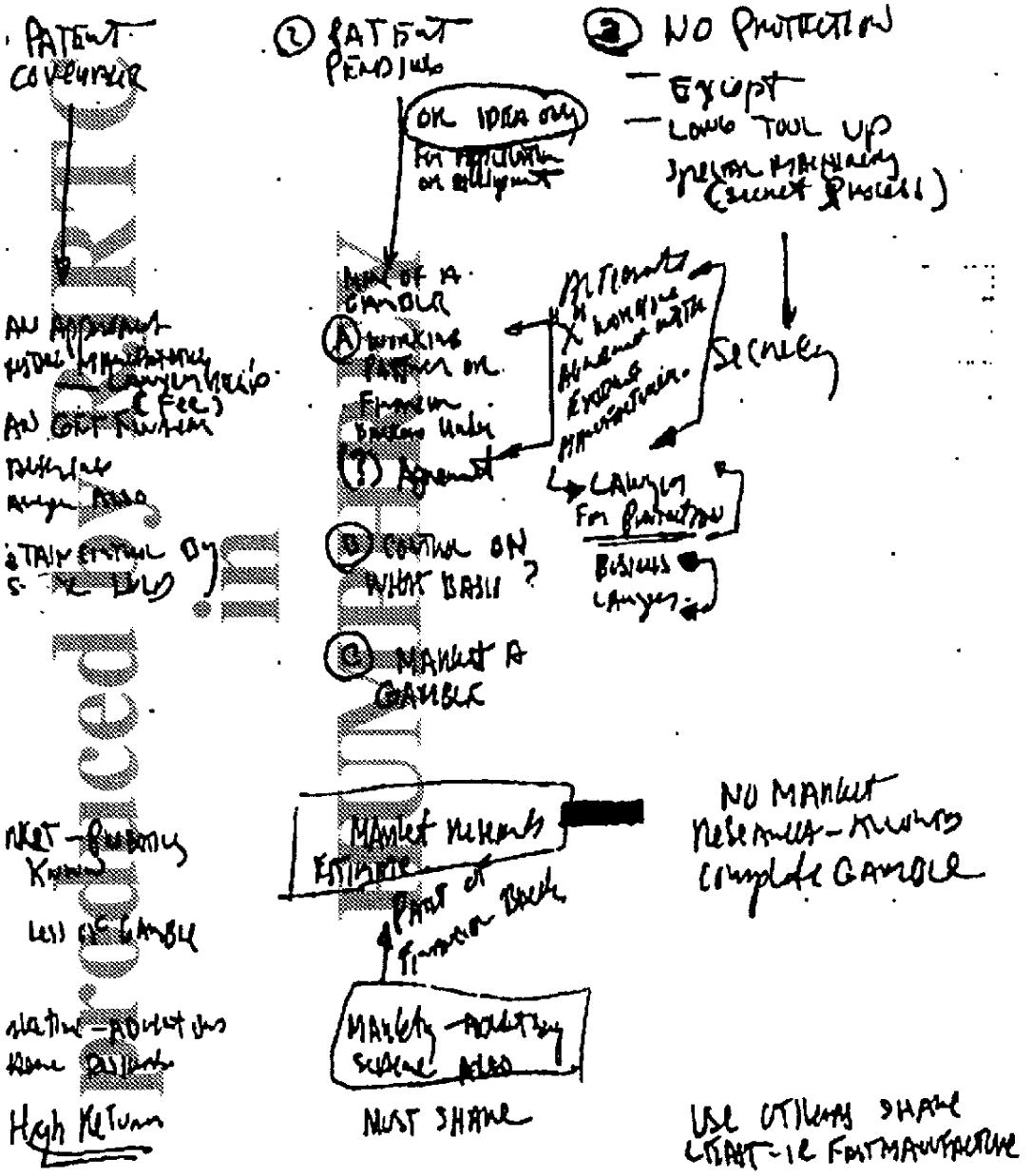

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June 1966

Special Report No. 248

MARKET POTENTIAL OF A HEALTH CIGARETTE

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Written by M. E. Johnston, Jr.

Approved by W. L. Dunn, Jr.

Distribution

Dr. K. Wakeham (10)
Dr. R. B. Seligman

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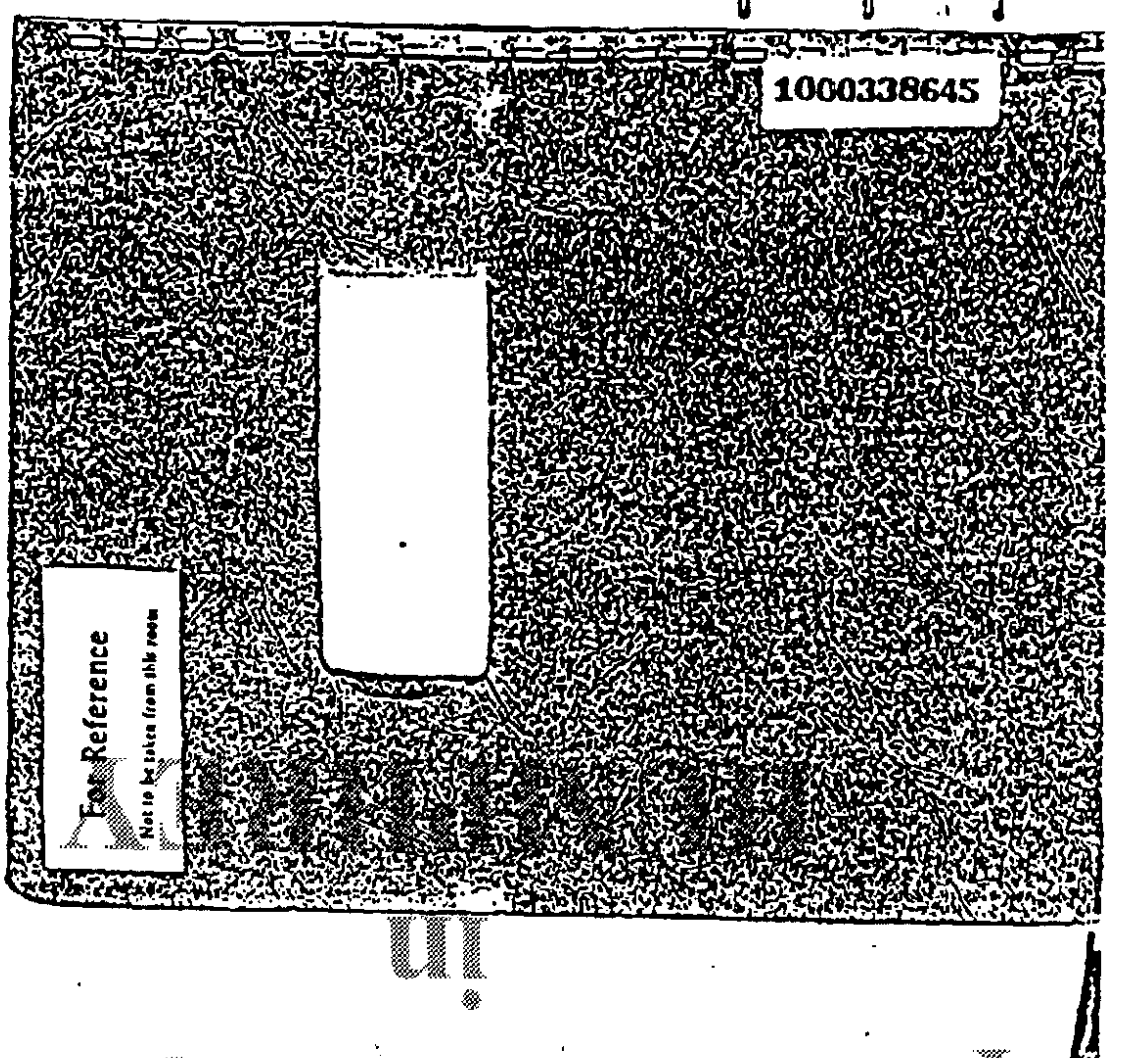

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1. CONCLUSIONS

As a result of the investigations summarized in this report I have reached the following conclusions:

1. A large proportion of smokers are concerned about the relationship of cigarette smoking to health (see Appendix).

2. The anti-cigarette propaganda will probably be more effective in reducing the rate of smoker recruitment than in stimulating smokers to quit or switch.

3. The market share of health cigarettes increases rapidly for a brief period during each health scare and quickly stabilizes at a new and higher level of market penetration.

4. The Surgeon General's Report had markedly less effect on the demand for health cigarettes than the first health scare in the 1950's. Any future health scares will probably have even less effect.

5. Thus a new health cigarette entry could not rely on increased demand for health cigarettes, but would have to take its place at the expense of existing brands of health cigarettes. However,

6. the health cigarette market is characterized by low brand loyalty, and should be fairly easy to penetrate.

7. Women, and particularly young women, would constitute the greatest potential market for a health cigarette.

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8. There is a growing willingness on the part of smokers, particularly women, to accept nontobacco flavor.

9. Here reduction in nicotine and TPM deliveries by conventional methods of filtration would not be a sufficient basis for launching a new cigarette, and to attempt it would be to court disaster.

10. The illusion of filtration is as important as the fact of filtration.

11. Therefore any entry should be by a radically different method of filtration but need not be any more effective.

12. Advertising should be directed to both sexes but in such a way as to have the greater appeal to women.

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II. RECOMMENDATIONS

Our posture with regard to a health cigarette entry should be determined by anticipated political and market conditions.

All indications are that 1966 elections will result in a Congress more sympathetic to business and less inclined than the present Congress to pass restrictive legislation.

My recommendation is that we not introduce a new health cigarette unless there is another health scare or additional restrictive legislation is passed. In the event of another health scare or restrictive legislation our entry should be determined by the form of the scare or legislation.

In the event of a resumption of the tar derby or the passage of legislation requiring a statement of "tar" and nicotine content on the pack, the delayed dilution cigarette could be a formidable entry as a full tobacco flavored cigarette. It could compare favorably with any health cigarette currently on the market yet deliver full flavor throughout the crucial first 40 mm of the rod. I am of the opinion that we should press development of this concept.

In the absence of legislation or a resumption of the tar derby, LongPer would probably be the best entry, since it is without question a radically different method of filtration and can be made to give the illusion of filtration without impairing the tobacco flavor. It is a unique concept that could catch on, but would probably have trouble reaching five billion in the absence of another health scare.

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III. ANALYSIS

Available evidence from surveys shows conclusively that smokers are concerned about the relationship of cigarette smoking to health but that they do not want to quit smoking. They are, however, changing their smoking habits, generally toward higher filtration, even at the expense of a loss of some tobacco flavor. That these changes are health motivated is clear from the timing of the shifts: The boom in filters came on the heels of the first health scare, and the Surgeon General's Report stimulated the shift to charcoal filters. The acceptance of menthol cigarettes and Lark indicates a willingness to accept nontobacco flavor as a substitute for tobacco flavor. There is some evidence that the anti-cigarette propaganda is more effective in reducing the rate of smoker recruitment than in changing the habits of smokers.

It should be noted that this report is an evaluation of the market potential of a "healthier" cigarette rather than a "healthy" cigarette. If we could develop a medically and governmentally endorsed "healthy" cigarette that tasted exactly like a Marlboro, delivered the nicotine of a Marlboro, and was called Marlboro, it would probably become the best selling brand. There is, of course, considerable doubt as to whether the medical profession and the federal government would ever endorse any cigarette.

Since any health cigarette we might develop would have to compete with the alleged "health cigarettes" now on the market, I have accepted as a working definition of a health cigarette the definition commonly used in the Research Center: All cigarettes about which health claims have been made or implied (charcoal filter

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cigarettes; Kent and Parliament; and minor brands such as Duke, Life, Sano, and True). L & M is a borderline case: At one time it was the major health cigarette entry and its sales patterns are described in this report, but it is not included in the definition of health cigarettes. Similarly, Philip Morris Menthol and Montclair are not included in this definition, although they could be considered health cigarettes by virtue of their charcoal filters. Since their combined sales constitute only 0.6% of the total cigarette market, however, their inclusion would in no way affect the analysis.

I have assumed that any health cigarette must compromise between health implications on the one hand and flavor and nicotine on the other. It seems clear from the performance of existing health cigarette entries that flavor and nicotine are both necessary to sell a cigarette. A cigarette that does not deliver nicotine cannot satisfy the habituated smoker and cannot lead to habituation, and would therefore almost certainly fail. Health claims alone without flavor or nicotine cannot sell cigarettes—most smokers would rather quite than switch.

A. Sales Patterns

The health scare in the 1950's was accompanied by a decline in cigarette sales (see Fig. 1), although the health scare was only one of many reasons for the decline. Of greater importance, probably, were the end of the Korean War and the accompanying recession, cigarette tax increases, and changes in the age composition of the population. The increase in sales of king-size cigarettes during this period also contributed to the overall decline in sales, since fewer king-size cigarettes are necessary to provide the same amount of tobacco. The health scare undoubtedly

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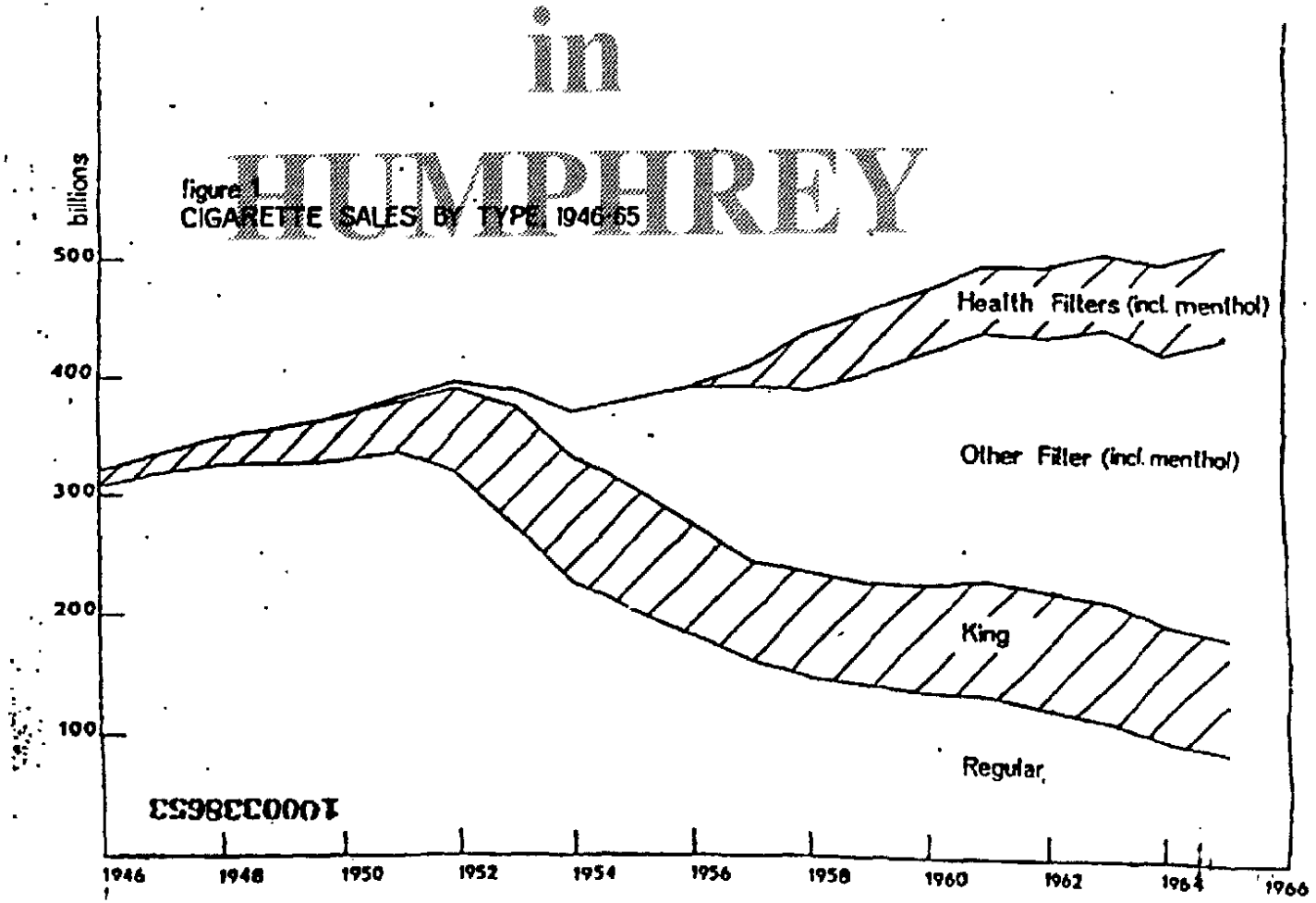
figure 1
CIGARETTE SALES BY TYPE, 1946-65



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was responsible for the rapid increase in filter cigarette sales, and contributed to the rise in king-size cigarettes (see Fig. 2). Apparently, however, the illusion of filtration was more important than the fact of filtration, and consumers were still most interested in flavor.

It is possible that the tar derby in the 1950's was a major factor in arousing concern over the question of smoking and health. L & M sales began a marked rise in 1955 after the favorable coverage in Consumer Reports that year and received an additional boost from Consumer Reports in 1957. The most spectacular performer in the 50's, of course, was Kent, which introduced the "Micronite filter" in July 1957, immediately after the release of the final report of the American Cancer Society study of smoking and health, and received rave reviews from Reader's Digest in July and August 1957 (see Fig. 3). It seems more than mere coincidence that Parliament experienced a three-fold increase in sales after favorable reports on the new filter in both Reader's Digest and Consumer Reports in early 1958. By 1959, smokers had apparently become inured to competing health claims and to the health scare in general. Duke of Durham and Life were both colossal flops, in spite of favorable reports in both Reader's Digest and Consumer Reports, and sales of Kent and L & M began to decline.

The health scare in 1964 was undoubtedly the cause of the cigarette sales decline, the accelerated shift to filters, and the 126% increase in sales of charcoal filters. The indirect approval given Lark by the Surgeon General's office probably helped all charcoal filters.

Tobacco Industry Documents

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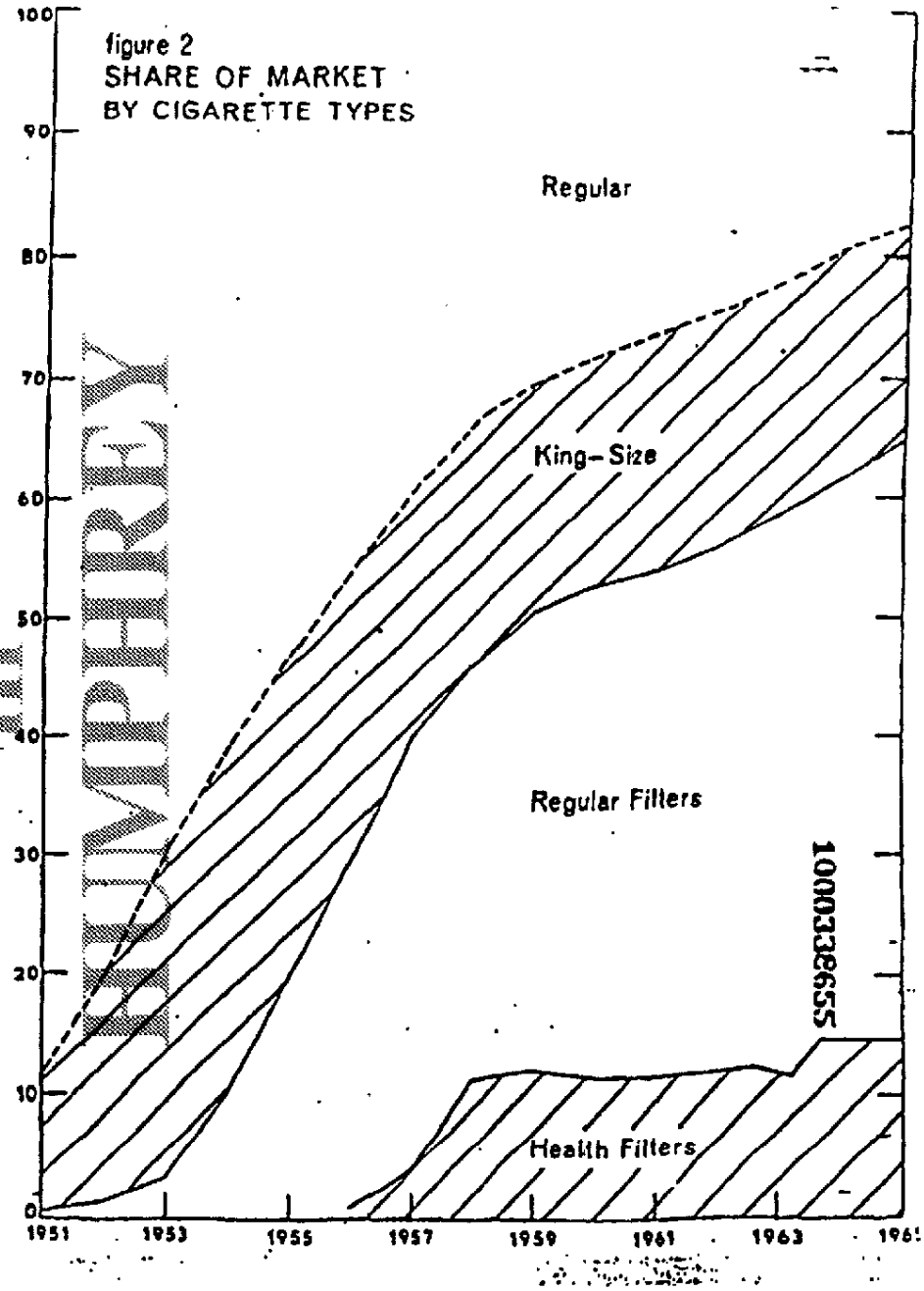

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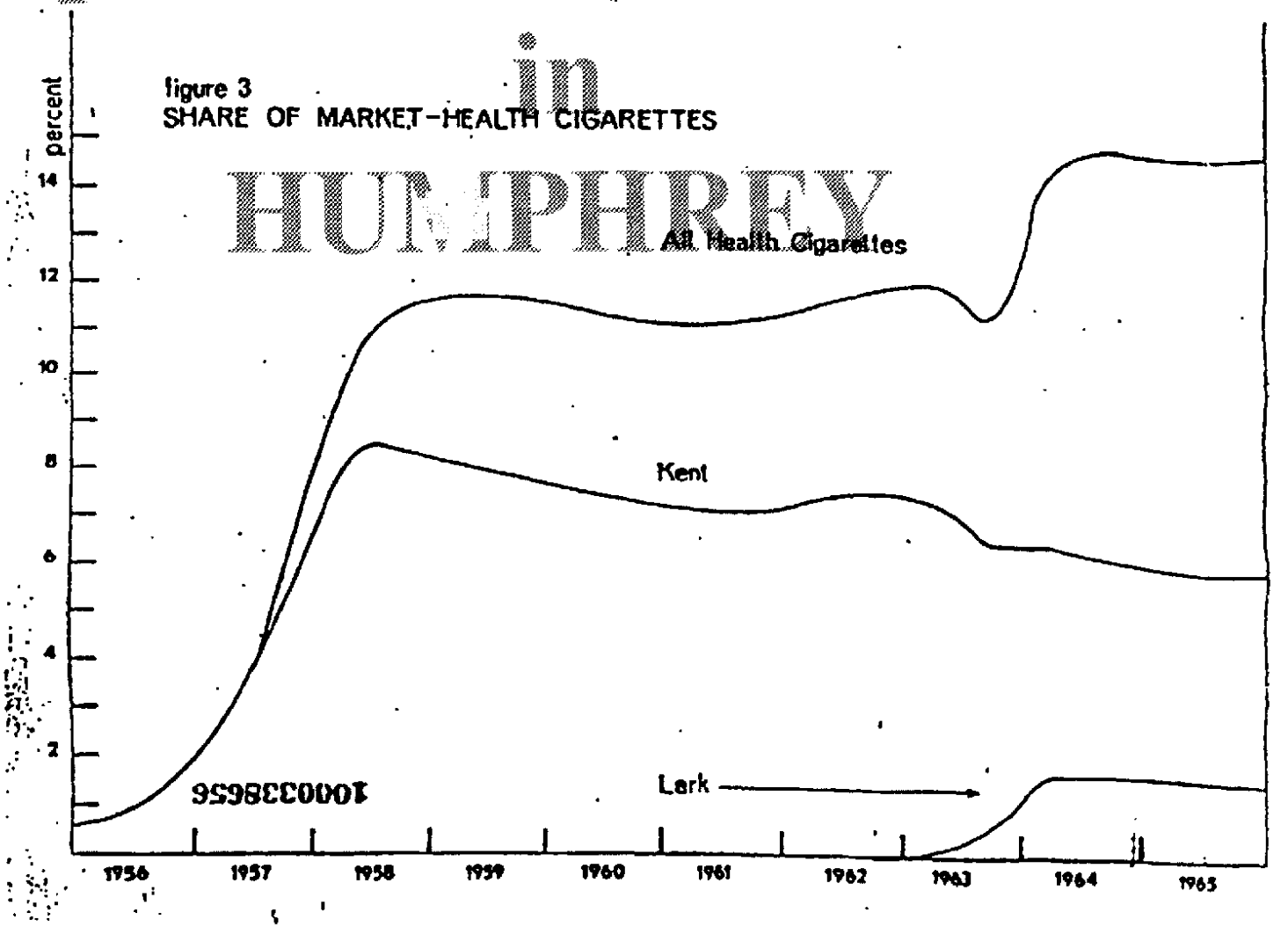
figure 3
SHARE OF MARKET—HEALTH CIGARETTES



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Health scares seem to have the effect of disturbing sales patterns after which the market adjusts to the disturbance and settles down to a new equilibrium. After the health scare in the 1950's, sales of health cigarettes rose from practically nothing in 1956 to nearly 12% of the market by late 1958. They maintained that market share until early 1964, when the market share jumped abruptly to slightly less than 15% and stabilized at that level. (See Figs. 2 and 3.)

Curiously, the greatest losers among filter cigarette during the recent health scare were the already established entries in the health cigarette market. Kent, L & M, and Parliament all experienced declines in market share from 1962 to 1964, while some full-flavor filter cigarettes (Winston, Viceroy, Raleigh) were increasing market penetration and others (notably Marlboro) were holding their own. Even Pall Mall and Raleigh nonfilters managed to increase their market share from 1963 to 1964. Switching patterns shed some light upon this phenomenon. During this period Pall Mall lost smokers largely to regular and menthol filters but picked up smokers of regular cigarettes. Winston, Viceroy, Raleigh and Marlboro lost smokers to menthol and health filters, but gained even more smokers from nonfilter brands, health cigarettes, and particularly charcoal filter cigarettes, cut very deeply into Kent and L & M.

All of this suggests that the health cigarette market becomes relatively stable after a sustained period of exposure to a given level of anti-cigarette propaganda. Thus the success of a health cigarette entry probably depends partly on timing. Kent, Newport, Carlton, Lark, Tareyton, and our own entries were all able to capitalize on the periods of rapid increase in the health

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cigarette market, while other cigarettes were poorly timed and notably unsuccessful. To the extent that success depends on timing, the success or failure of a health cigarette is tied to the intensity of anti-cigarette propaganda, which is a random variable and unpredictable.

B. The Beginning Smoker

Persons under 25 years of age constitute over one-fourth of the total number of smokers. Of greater importance is the fact that this group will increase by about 18% between now and 1971. This is over three times the rate of increase in the population aged 25 and over. Any intensification of the anti-cigarette propaganda will almost certainly be aimed largely at this group. Indeed, there is evidence that the health scare has already had an effect on the rate of smoker recruitment and on the smoking habits of the under-25 group (see Item 13 in Appendix).

It seems highly unlikely that the availability of a demonstrably healthier cigarette would result in a change in the form of the anti-cigarette propaganda: It is difficult to conceive of the propagandists changing their injunction from "Don't smoke!" to "If you must smoke, smoke a health cigarette." If the anti-cigarette drive continues to have an effect on young people, it will probably be to dissuade them from smoking altogether rather than to cause them to smoke health cigarettes.

Tobacco flavor is absent or far down in lists of reasons given for beginning to smoke, so it should be theoretically possible for a health cigarette to satisfy the most common reasons (to be

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like friends, to feel or look older, to combat nervousness, to be rebellious). This is apparently not the case. Young smokers are the ones most willing to accept regular filters but least likely to smoke health cigarettes (see Table I).

Apparently the reasons for beginning to smoke dictate the choice of brand as well, particularly for males. They appear to choose cigarettes that project the proper image. Males under 25 are much more likely than those over 25 to smoke Winston, Marlboro and Lucky Strike (filter and nonfilter), all of which project a male image; and less likely than their elders to smoke Kent and Lark, which are thought of (and indeed are) women's cigarettes. Young males are also more likely to follow the crowd: The top two brands among young males (Winston and Marlboro) together account for nearly 40% of this market, while for other age groups the market penetration of the top two brands is less than 22% except for those 55 and over. This tendency for young smokers to select a brand to be like their friends was also noted in a November 1961 study done for us by Opinion Research Corporation. In that study it was thought that beginning smokers would seek out a mild cigarette, since the initial act of smoking is designed to satisfy appearance rather than taste. As noted above, however, self-image extends to the choice of brand as well. This suggests that there is something of a stigma attached to smoking health cigarettes and that a health cigarette would not be well received by young males.

Young females appear to be more willing to accept health filters, and for them the health filter may have some prestige value. They also are more willing to accept nontobacco flavors such as Lark and menthol brands. With young women it may be true that the fact

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TABLE I

CIGARETTE TYPE PREFERENCES BY AGE AND SEX, 1965

Male

Age	Nonfilter	Menthol Filter	Health Filter	Other Filter
18-24	28%	13%	6%	53%
25-34	37	16	13	35
35-44	36	14	16	33
45-54	39	11	18	32
55 and over	40	16	15	30

Female

Age	Nonfilter	Menthol Filter	Health Filter	Other Filter
18-24	18%	29%	19%	34%
25-34	17	30	23	31
35-44	22	27	23	29
45 and over*	26	28	22	23

Source: 1965 HTI Report. Data from other sources show essentially the same pattern.

*Females 55 and over have been combined with those age 45-54 because of the small size of the sample.

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of smoking is the major motivation and that a mild cigarette would be acceptable. Their willingness to accept health filters may increase now that the American Cancer Society purports to have found a relationship between smoking and health for women as well as for men. This group could provide a market for a health cigarette.

C. Potential Switchers

Since beginning smokers do not constitute a particularly good market for a health cigarette, we must look to potential switchers for a market. As shown below, the magnitude of switching both between and within cigarette types is directly related to the intensity of the health scare:

Period	% of All Smokers who Switched: To a Different Cigarette Type	To a Different Brand of the Same Type
Feb. 1957-Feb. 1958	21	10
Mar. 1958-Mar. 1959	17	6
June 1960-June 1961	11	7
Mar. 1962-Mar. 1963	10	5
May 1964-May 1965	17	10

Source: HTI Reports

It appears from these data and those cited above that the effect of the health scares on present smokers is to loosen brand loyalty and cause smokers to shift back and forth between brands and types of cigarettes in proportion to the intensity of the anti-cigarette

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propaganda, with an overall shift toward filter cigarettes and nontobacco flavors. Several studies have shown that a large proportion of smokers believe that any filter reduces the health hazard, and a much smaller proportion believe that charcoal filters afford more protection.

Smokers seem to be able to justify continuing to smoke whatever type they happen to prefer: Nonfilter smokers question the efficacy of filters altogether; smokers of regular filters question the value of charcoal filters; and smokers of charcoal filters tend to believe that charcoal filters are healthier.

As mentioned above, an effect of the health scare in the 1950's was to increase the market penetration of health cigarettes from practically nothing in 1956 to about 12% by late 1958, and the release of the Surgeon General's Report was followed by an abrupt increase to just under 15%. It is clear from these data and from switching patterns that the shifts to health filters occur concurrently with health scares, and further that the effect of the first scare was much greater than the effect of the Surgeon General's Report (see Figs. 2 and 3). On the basis of these data we might reasonably expect that any future health scares will have even less effect on sales of health filters.

Thus, indications are that health cigarettes will maintain a fairly constant share of the market even in the event of an intensification of anti-smoking propaganda. A new entry, therefore, would have to take its place at the expense of existing health filter brands. This, however, should not be particularly difficult. Health cigarette smokers seem to be an unusually fickle lot and there is a considerable amount of switching among brands on their part. This

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probably results in part from the newness of the entries and the low degree of brand loyalty, and in part from attempts of smokers to find a health cigarette with a satisfactory taste level. The acceptance of Lark, as well as menthol cigarettes, suggests that nontobacco taste is acceptable to a segment of the market in lieu of tobacco flavor.

The speed with which charcoal filters penetrated the health cigarette market shows the effectiveness of a new concept. The public had been conditioned to accept the filtering effects of charcoal in other fields, and when charcoal was added to cigarette filters it proved to be an effective advertising gimmick. The main beneficiary, of course, was Tareyton, which was the first entry in the market.

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Summarized below are some of the surveys concerned with public reaction to the relationship between cigarette smoking and health.

1. In a 1955 Survey Research Center survey of Ann Arbor, Michigan, half of the smokers interviewed said they had changed their smoking habits during the previous year. Of these, 40% said the change resulted from the smoking and cancer scare, but only 8% had stopped smoking.

2. A 1959 survey of Italian smokers showed that 70% of smokers believed filter tips to be less injurious to health than nonfilters, but only about 10% smoked filters.

3. A study done for us in 1961 by Opinion Research Corporation showed that smokers are concerned about the fact that they smoke, largely because of the fear of a link between smoking and cancer. Few of the interviewees, however, had attempted to stop or planned to do so.

4. In 1962, 1100 students in a New York City high school answered a questionnaire after seeing a film on smoking and health. Seventy-five per cent reported that they smoked, and half of the smokers said they planned to cut down or stop. In Baltimore, however, after a year of intensive anti-smoking propaganda, students were smoking as much as before, and more than students in the control group.

5. In 1963, the New York Times reported a study in which only 14% of regular cigarette smokers considered the habit "pleasurable, safe and worth the cost." Cigarette sales in 1963 were up 2.7% from 1962.

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6. In mid-1964, a survey in West Germany revealed that 98% of the smokers queried had heard of the U. S. Surgeon General's Report. Sixty-three per cent believed it, ninety-two per cent smoked as much as before, five per cent smoked less, three per cent smoked much less. In June 1964 cigarette sales reached an all-time high. Most cigarettes had lower nicotine and tar than before the report. In the first quarter of 1965, cigarette sales were 6% above 1964 and 17% above 1963. By early 1965 about 7% of West German cigarettes were "free from nicotine and also mostly free from tar."

7. Throughout Europe the proportion of filter tip cigarettes increased from 1963 to 1964: From 80 to 82% in West Germany, 81 to 84% in Switzerland, 42 to 47% in Belgium. In Sweden, filter tips increased from 17% of the market in 1963 to 29% in 1965. Increases in the proportion of filters were also recorded in Austria and the Netherlands.

8. In late 1964 a Public Health Service survey showed that "a large majority of the cigarette smokers surveyed indicated they believed smoking to be harmful." Eighty per cent of all respondents (and 70% of smokers) thought a statement of tar and nicotine contents should be required on the pack. Sixty-nine per cent of all respondents thought cigarettes caused lung cancer and ninety per cent favored public education on health hazards of smoking. At this time, according to the Surgeon General, 18 million Americans had sworn off cigarettes.

9. In a January 1965 survey of 21,000 Pittsburgh students, 78% of high school students and 87% of junior high students said the anti-smoking propaganda they received in health classes was sufficient to deter them from smoking.

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Produced by Philip Morris

10. In February 1965, Samuel Lubell published the results of interviews with "a cross-section of randomly selected smokers." Slightly more than half of the interviewees were sufficiently worried that they tried to quit smoking within the previous year. Of the remainder, over half were convinced that cigarettes are harmful.

11. In February 1966, when Lorillard was rumored to have developed a new and improved filter, their stock jumped ten points. When the rumor was denied, the stock lost only five points of the gain.

12. In May 1966, Luther Terry, former Surgeon General, opined that 18 million Americans had quit smoking in the 28 months since the Surgeon General's Report. He also estimated that 4500 youngsters begin smoking every day. If this is true it means that 45-50% of potential new smokers are smoking, and does not imply a significant reduction in the rate of smoker recruitment. Curiously, 18 million quitters was precisely the figure he used a year and a half earlier (see item 8 above) and suggests either that the earlier estimate was an exaggeration or that no smokers have quit since late 1964.

13. In a March 1965 survey done for Philip Morris by Elmo Roper, only 11% of the people who had tried new brands of cigarettes did so for health reasons. However, fewer people than expected had begun to smoke within the previous year, and the proportion of 18-20 year-olds smoking fell from 50% in 1963 to 40% in 1965. This suggests that the Surgeon General's Report is more effective in reducing the rate of smoker recruitment than in stimulating switching. That younger people are most susceptible to anti-smoking propaganda is suggested by the per cent of smokers in each age group who indicated that they had given up smoking for at least two weeks during the previous year:

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Age	%
18-20	42
21-24	45
25-34	30
35-49	24
50 and over	22
Total, all ages	28

That men are more susceptible than women is suggested by the per cent of each sex who reported that they smoke in three successive Roper studies:

	% Who Smoke Cigarettes:	
	Male	Female
1960	52	32
1963	50	35
1965	47	36

While these year to year changes are not statistically significant, other sources, notably HTI, show the same trend, and this trend bears watching.

In the 1960 and 1965 studies smokers were asked to indicate which of four statements best expressed their feelings about cigarettes and cancer, with the following results:

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	March 1960 N=1036	March 1965 N=1661
It didn't bother me at first but this continuing talk of cigarettes and cancer is beginning to really worry me.	14%	10%
It didn't bother me at first and this continuing talk of cigarettes and cancer still doesn't really worry me.	51	44
It did bother me at first and this continuing talk of cigarettes and cancer is making me more worried.	7	13
It did bother me at first, but this continuing talk of cigarettes and cancer doesn't seem to bother me as much any more.	19	24
Don't know or no answer	9	9
Total becoming more worried	21	23
Total not worried and less worried	70	68

This implied no significant difference in concern.

It should be noted, however, that these questions were asked only of smokers. If ex-smokers had been included, the proportion indicating concern would undoubtedly have been higher.

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MARKET POTENTIAL OF A HEALTH CIGARETTE

M.E. JOHNSTON JR.

POSSIBLE APPLICATION TO [illegible] FILTER

PAGE

3 WOMEN YOUNG WOMEN WOULD CONSTITUTE THE GREATEST POTENTIAL MARKET FOR A HEALTH CIGARETTE.

2 "WOMEN ACCEPT LESS TOBACCO FLAVOR"

THE ILLUSION OF FILTRATION IS AS IMPORTANT AS THE FACT OF FILTRATION.

ADVERTISING SHOULD HAVE GREATER APPEAL TO WOMEN.

5 Reference to habitual smoker.

7 DUKE LIFE FLIP - DISPLAYS FAMILIAR [illegible] IN READER'S DIGEST

10 HEALTH CIG'T PROBABLY DEPENDS UPON TIMING.

11 PROBABLY TIED TO THE INTENSITY OF ANTI-CIG'T PROPAGANDA.

11 NOT LIKELY - "If you must smoke, smoke A HEALTH CIG'T."

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R. A. TAMOL
JUN 30 1966

12 – HEALTH FILTER MAY HAVE SOME PRESTIGE VALUE.

16 – EFFECTIVENESS OF HIGH CONTRAST

15% OF MARKET – HEALTH SMOKERS

$10 Billion
15%
1550
-10
7.650 BILLION

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C61-00632

Mr. Hugh Cullman March 24, 1961

H. Wakeham

Trends of Tar and Nicotine Deliveries over the last 5 Years

It is interesting to observe from these preliminary charts of nicotine and tar delivery trends that most cigarettes are running in the area of 28 to 30 milligrams of T. P. M. per cigarette with between 5 and 6 nicotine in the T. P. M. Below this value you have the Kent and the odd cigarettes with very low deliveries. Above this value you have the king, non-filter cigarettes. Upon studying these charts we speculated that smokers fall into a more or less normal distribution pattern centered on the 28 to 30 milligram range. At the bottom end you have those smokers concerned with the health scare who have acclimated themselves to very low deliveries. At the top end you have the heavy smokers who smoke either the king, non-filters or the regular, non-filters. The king, non-filter smokers and the regular, non-filter smokers may actually be smoking to a comparable delivery, the former group omitting the last puff or two and the latter group smoking down to the bitter end.

EXHIBIT Carchman #6 Kmo 3-28-01

The announcement of "health facts" such as that by Hammond at the last American Cancer Society meeting probably shifts a number of people towards the low side, but I have a feeling that the distribution pattern of total intake is not being changed very much. The cigarettes which are now growing, the Marlboro, the Winston, the Salem, the Camel, and the Pall Mall, are all delivering approximately 30 milligrams of T. P. M. or more with about 0. nicotine content. As we know, all too often the smoker who switches to a hi-fi cigarette winds up smoking more units in order to provide himself with the same delivery which he had before. In short, I don't believe the smoking pattern has changed much, even with cancer scares and filter cigarettes.

Now the question arises as to whether other cigarette companies have taken deliberate positions in order to anticipate the results of an A. C. S. survey. In answering the question, I suggest we ignore the odd ones such as Sano, Spring, and Duke, since these do not represent an appreciable part of the market. This leaves us, then, with Kent, Viceroy, Newport, Parliament and Old Gold regulars or longs as being on the low side where they have always been. The really pronounced change in delivery has occurred with the Reynolds products. They have brought both Salem and Winston down from the 40 milligram level to below 30, where these cigarettes are now in the same delivery range as Marlboro, L & M, and Taroyton. If it is true that Reynolds has made a change of this sort, then that might be construed as confirming our judgment regarding what the delivery should be for a popular filter cigarette.

cc: Mr. R. P. Roper, Mr. W. H. Hatcher, Mr. Ross Millhiser
HW:br

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Plaintiff Exhibit 4205

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C70-04388

PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

RICHMOND, VIRGINIA

To: Dr. H. Wakeham Date: September 2, 1970

From: R. Fagan

Subject: Biological Significance of "Tar"

The proposed requirement by the FTC that the tar and nicotine deliveries of cigarets be displayed in advertising raises the question anew of the biological significance of these "numbers." In the announcement of the forthcoming hearings the FTC has stated that it has decided on this course of action after seeing a technical report by the Department of Health, Education and Welfare in which various epidemiologic, pathologic, and empirical studies are cited as providing evidence for a dose-response (more "tar" means more cancer). Hence this is the basic assumption which leads the FTC to decide that the smoker should have some notion about how much tar he is taking in.

There is a second assumption which is implicit in the FTC's requirement for the revelation of tar and nicotine content. This assumption is that "tar" is "tar" is "tar." Although superficially this seems like a reasonable assumption, there is little evidence to validate it. As a matter of fact, much of the evidence available seems to point in the opposite direction - there are differences in the carcinogenic potential in "tars" as seen over time and as seen in the large numbers of skin-painting experiments conducted by many investigators particularly in the United States.

The evidence to be marshalled is the following:

(a) The carcinogenic potential of "tar" has decreased over the past 15 years.
(b) "Tar" derived from burley tobacco is less carcinogenic than "tar" from bright tobacco.
(c) Air-cured tobacco gives a "tar" which is less carcinogenic than flue-cured tobacco.
(d) "Tar" derived from cigars is more carcinogenic than "tar" from cigarets.
(e) "Tar" from filter cigarets is less hazardous than "tar" from the same cigaret without the filter.

Here are the particular citations for what has just been cited:

(a) Wynder & Hoffman (1969) have cited their own work which demonstrates that from the year 1955 to 1965 cigaret condensate, mg for mg, has reduced carcinogenic potential. Mice yielded fewer tumors at the end of the period than at the beginning. The drop was from ~45% to ~20%. To show that the susceptibility of mice had not decreased over that period and that the technique for producing tumors in mice had not changed, the

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EXHIBIT Carchman 9 CMO 3-28-0

Plaintiff Exhibit 4304

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numbers of tumors produced by painting with BaP had increased during the same time period from ~65% to ~80%.

(b) Wynder & Hoffman (1965) showed that the mg for mg different tobaccos gave different % mice showing papillomas: bright and Turkish gave ~35% while Maryland gave ~25% and burley only ~18%.

(c) Bock, Moore & Clark (1965) demonstrated that condensate from English cigarets (flue-cured) gave tumors on ~45% of the mice while American cigarets (air-cured) produced tumors on only ~20% of the mice.

(d) Davies & Day (1969 showed that ~28% of mice painted with condensate of a standard British cigaret had tumors while ~45% of mice painted with condensate of cigars had tumors.

(e) Hammond & Auerbach (unpublished, 1970) showed that in dogs exposed to smoke, equal amounts of particulates did not give equal numbers of lesions. If the smoke went through a filter first, there were no invasive tumors while the same amount of smoke without going through a filter gave several invasive tumors. In regard to other pulmonary lesions, fibrosis, emphysema, total tumors, the dogs exposed to filtered smoke had only half as many lesions as dogs exposed to non-filtered smoke.

Smokers determine how much smoke they take in - not the cigaret. In the last 15 years particulates in cigaret smoke have declined by 33%; however, the number of cigarets per smoker has increased. Furthermore, experimental studies have shown that a smoker will increase the number of cigarets he smokes if the cigaret he is offered contains less particulates and less nicotine.

As a strategy in meeting the FTC, I would suggest a "Yes, but" approach. The Industry might agree with placing "tar" and nicotine content on advertisements. After all every one of the big six has at least one brand which is being promoted by stating its delivery; however, it must be pointed out, on the basis of previously stated evidence, that the situation is notsimple and that hence the FTC is deluding the public.

In the same vein the industry ought to determine how this is to be administered. Without a doubt the FTC will say that the companies should make their own determinations and that the FTC, in its lab, will police the numbers. Does this take into consideration the variance in the numbers? If a company decides to play safe and put a higher number on its ad, will FTC claim false advertising?

R. Fagan

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PHILIP MORRIS U. S. A.

INTER-OFFICE CORRESPONDENCE

RICHMOND, VIRGINIA

To: Mr. Leo F. Meyer Date: September 17, 1975

From: Barbro Goodman

Subject: Marlboro - Marlboro Lights Study Delivery Data

INTRODUCTION

On January 3, 1975 a memo was sent to you concerning smoker profiles collected in the Marlboro - Marlboro Lights study. Since that time we have been able to use the Smoker Simulator in determining a series of TPM deliveries. Included in these smokings were cigarettes from the study above.

DISCUSSION

The smoker profile data reported earlier indicated that Marlboro Lights cigarettes were not smoked like regular Marlboros. There were differences in the size and frequency of the puffs, with larger volumes taken on Marlboro Lights by both regular Marlboro smokers and Marlboro Lights smokers. There were a total of nine smokers participating in the study, which spanned a period of four weeks. The first two weeks they smoked their regular brand and then switched exclusively to the alternate cigarette (Marlboro 85 or Marlboro Lights). The average smoker parameters for the cigarettes smoked on recording units are listed in Table I. The parameter information was obtained by Multivariate Statistical Analysis, a method of averaging which takes into account the fact that all smokers do not take the same number of puffs. The analysis evaluates each puff according to the total number of puffs on the cigarette rather than giving equal weight to all puffs. Command tapes for Simulator smokings were based on these averages of puff volumes, puff durations, maximum flow rates and the intervals between puffs. The observed arithmetic means of the smoker parameters are illustrated in Figures 1 - 4 for the first nine puffs on both cigarettes.

The Simulator smokings of production Marlboro 85 and Marlboro Lights cigarettes were divided into three stages:

A. Command tapes based on data from the entire group of smokers (Tapes #17 and 39).

B. Command tapes based on data from regular Marlboro 85 smokers only (Tapes #40 and 27).

C. Command tapes based on data from Marlboro Lights smokers only (Tapes #34 and 35).

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A. The Marlboro 85 cigarettes were smoked on the Simulator with varying parameters. The puff volumes ranged from 49 to 38 cc. TPM delivery was 24.7 mg, which is equal to C.I. puff by puff delivery for the same number of puffs (Tables II and III).

Marlboro Lights, on the other hand, delivered 19.6 mg TPM on the Simulator with puff volumes ranging from 55 to 45 cc. C.I. puff by puff TPM delivery for eight 35 cc puffs was 15 mg (Table III).

There were several possible reasons why the Marlboro Lights delivered more TPM to the smoker than C.I. values would indicate while Marlboro 85's showed no increase in delivery from the Simulator smokings: (1) the larger puff volumes taken on Marlboro Lights cigarettes, (2) a change in filter efficiency when the test cigarettes were smoked at higher than usual flow rates, (3) the faster burning paper on Marlboro Lights put the last puff closer to the filter where the TPM delivery is higher.

B. The smoker parameters were also grouped by the smokers' regular brands. The subjects smoking Marlboro 85 as their regular brand took significantly larger puffs than the Marlboro Lights smokers. The differences in puff sizes are contributing directly to the variations in TPM deliveries between the two groups of smokers as shown in Table IV.

The Marlboro 85 smokers' tapes (numbered 40 and 27) contained data not significantly different from each other. Therefore, they would also be expected to give similar levels of TPM for Marlboro 85 and Marlboro Lights cigarettes. Smoked on the Simulator, they both delivered 27.8 mg TPM (Table IV).

C. The tapes generated by Marlboro Lights smokers (numbered 34 and 35) had short puff durations and intervals, even shorter than the standard C.I. puffs. The short intervals and the low volumes contributed to low deliveries from these Simulator smokings. Marlboro Lights delivered 17.9 mg TPM to the smoker and Marlboro 85, which was smoked with the smallest puffs (36.6-27 cc), delivered only 16.5 mg TPM on 9 puffs.

CONCLUSIONS

The smoker data collected in this study are in agreement with results found in other project studies. The panelists smoked the cigarettes according to physical properties; i.e., the dilution and the lower RTD of Marlboro Lights caused the smokers to take larger puffs on that cigarette than on Marlboro 85's. The larger puffs, in turn, increased the delivery of

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Marlboro Lights proportionally. In effect, the Marlboro 85 smokers in this study did not achieve any reduction in smoke intake by smoking a cigarette (Marlboro Lights) normally considered lower in delivery. Conversely, the Marlboro Lights smokers did not increase their smoke intake when they changed to the regular delivery cigarette.

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BG/hws

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TABLE I

COMMAND TAPE INPUT DATA - SMOKER AVERAGES

Cigarette Smoked By Panelist	Command Tape	Puff Parameter	Puff Number 1	2	3	4	5	6	7	8	9	Average
Marlboro 85	837[1]	Volume, cc	48.4	46.8	45.4	43.9	43.6	42.2	40.8	39.4	38.0	44.27
		Duration, sec.	2.11	2.05	1.99	1.87	1.78	1.69	1.60	1.51	1.42	1.83
		Interval, sec.	--	31.2	40.6	44.3	47.4	50.9	54.3	57.7	61.1	45.74
		Max. Flow, cc/min.	2326	2369	2413	2456	2499	2543	2586	2630	2673	2478
Marlboro Lights	839	Volume, cc	55.1	53.5	51.8	50.1	48.4	46.7	45.1	43.4	41.7	49.25
		Duration, sec.	2.16	2.08	2.00	1.92	1.84	1.76	1.68	1.60	1.52	1.88
		Interval, sec.	--	29.6	35.1	40.5	46.0	51.5	57.0	62.4	67.9	43.28
		Max. Flow, cc/min.	2601	2625	2649	2674	2698	2723	2747	2772	2796	2686
Marlboro 85	840	Volume, cc	56.9	55.5	54.2	52.8	51.4	50.0	48.6	47.3		52.77
		Duration, sec.	2.33	2.25	2.17	2.09	2.01	1.93	1.85	1.77		2.09
		Interval, sec.	--	42.9	46.0	49.0	52.1	55.1	58.2	61.2		49.02
		Max. Flow, cc/min.	2552	2583	2634	2685	2736	2787	2838	2889		2685
Marlboro Lights	827	Volume, cc	59.6	58.3	56.9	55.6	54.2	52.9	51.5	50.2		55.59
		Duration, sec.	2.33	2.27	2.21	2.15	2.09	2.03	1.97	1.91		2.15
		Interval, sec.	--	36.0	41.6	47.3	52.9	58.6	64.2	69.8		47.27
		Max. Flow, cc/min.	2636	2662	2688	2714	2741	2767	2793	2819		2714
Marlboro Lights	834	Volume, cc	48.7	46.6	44.5	42.4	40.3	38.2	36.1	34.0	31.9	41.32
		Duration, sec.	1.89	1.79	1.69	1.59	1.49	1.39	1.29	1.19	1.09	1.54
		Interval, sec.	--	25.1	30.4	35.7	40.9	46.2	51.5	56.7	62.0	38.29
		Max. Flow, cc/min.	2572	2595	2619	2640	2662	2684	2707	2729	2752	2651
Marlboro 85	835	Volume, cc	38.6	37.2	35.8	34.3	32.9	31.5	30.1	28.7	27.3	33.64
		Duration, sec.	1.84	1.74	1.64	1.54	1.44	1.34	1.24	1.14	1.04	1.49
		Interval, sec.	--	32.0	35.9	39.7	43.6	47.4	51.3	55.2	59.0	41.64
		Max. Flow, cc/min.	2098	2133	2167	2201	2235	2269	2303	2337	2371	2220

[1]Category of Smokers Listed in Table II.

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TABLE II

TOTAL DELIVERIES OF MARLBORO 85 AND MARLBORO LIGHTS
HUMAN SMOKER SIMULATOR

Command Smoker Tape No.	Cigarette Smoked	TPM (mg)	Tar (mg)	Nicotine (mg)	Water (mg)	Puff Count
17	MR6	24.7	20.2	1.5	3.0	9
39	ML6	22.5	17.8	1.4	3.3	9
40	MR6	27.8	21.7	1.4	4.7	8
27	ML6	27.8	22.1	1.4	4.3	8
34	ML6	17.9	15.2	1.1	1.6	9
35	MR6	16.5	14.3	.9	1.3	9

C.I. PUFF BY PUFF MACHINE

MR6	24.5	19.5	1.4	3.6	9
ML6	14.9	12.7	1.0	1.2	8

NOTE:

Tape #17 contains parameter data for all smokers as they smoked Marlboro 85

Tape #39 contains parameter data for all smokers as they smoked Marlboro Lights

Tape #40 contains parameter data for Marlboro 85 smokers as they smoked Marlboro 85

Tape #27 contains parameter data for Marlboro 85 smokers as they smoked Marlboro Lights

Tape #34 contains parameter data for Marlboro Lights smokers as they smoked Marlboro Lights

Tape #35 contains parameter data for Marlboro Lights smokers as they smoked Marlboro 85

MR6 = Marlboro 85

ML6 = Marlboro Lights

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TABLE III

PUFF BY PUFF DELIVERIES FOR
MARLBORO 85 AND MARLBORO LIGHTS - ALL SMOKERS

Cigarette Model	% Recovery	Puff by Puff Delivery (mg) 1	2	3	4	5	6	7	8	9	Total Deliv. (mg)	Deliv. (mg) at 100% Recovery	
MR6 Simulator Tape #17	103.5	1.94	2.58	2.68	2.85	2.97	2.90	3.25	3.24	3.42	25.61	24.74	TPM
		.10	.15	.17	.18	.19	.18	.19	.18	.18	1.52	1.47	Nic.
		.17	.20	.25	.30	.34	.34	.41	.50	.63	3.14	3.03	H_2O
		1.67	2.03	2.26	2.37	2.44	2.38	2.63	2.56	2.61	20.95	20.24	Tar
ML6 Simulator Tape #39	104.0	1.78	2.38	2.42	2.65	2.71	2.75	2.73	3.01	2.94	23.37	22.47	TPM
		.09	.14	.15	.17	.18	.19	.18	.19	.17	1.46	1.40	Nic.
		.29	.26	.27	.33	.32	.36	.46	.58	(.58)[1]	3.45	3.32	H_2O
		1.40	1.98	2.00	2.15	2.21	2.20	2.09	2.24	(2.19)	18.46	17.75	Tar
MR6 C.I. Lab Smokings		1.66	2.05	2.27	2.44	2.51	2.75	2.89	3.38	4.52	24.45		TPM
		.10	.13	.14	.16	.16	.17	.18	.19	.18	1.40		Nic.
		.19	.25	.10	.26	.24	.26	.32	.52	1.34	5.56		H_2O
		1.37	1.67	1.93	2.02	2.11	2.30	2.39	2.67	3.00	19.46		Tar
ML6 C.I. Lab Smokings		1.25	1.58	1.62	1.80	1.89	2.12	2.21	2.45	--	14.92		TPM
		.08	.09	.11	.12	.13	.14	.14	.15	--	.96		Nic.
		.19	.25	.12	.14	.17	.15	.17	.23	--	1.25		H_2O
		1.07	1.34	1.39	1.54	1.59	1.83	1.90	2.07	--	12.73		Tar

[1] Data estimated.
MR6 = Marlboro 85
ML6 = Marlboro Lights

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TABLE IV

SIMULATOR DELIVERIES FOR MARLBORO 85 AND MARLBORO LIGHTS SMOKER GROUPS

Smoker Group	Cigarette Smoked	% Recovery	Puff By Puff TPM Delivery (mg) 1	2	3	4	5	6	7	8	9	Total TPM Delivery (mg)	TPM Delivery at 100% Recovery [mg]
MF 85	MR85 Tape #40	103.3	2.64	3.21	3.13	3.41	3.36	3.72	3.92	4.78		28.2	27.3
MF 85	MR85 Tape #40	105.7	2.82	3.28	3.33	3.37	3.62	3.75	4.22	5.58		29.9	28.3
												Avg.	27.8
MF 85	ML6 Tape #27	101.9	2.34	2.57	2.94	3.07	3.39	3.35	3.77	3.91		25.3	24.8
MF 85	ML6 Tape #27	99.6	2.86	3.19	3.44	3.76	3.29	4.24	4.39	5.33		30.5	30.7
MF 85	ML6 Tape #27	106.7	2.62	2.82	3.36	3.58	3.79	3.83	4.51	5.26		29.8	27.9
												Avg.	27.8
ML 6	ML6 Tape #34	100.0	1.73	1.92	1.90	2.11	1.97	2.13	2.01	1.95	2.16	17.9	17.9
ML 6	MR85 Tape #35	105.9	1.63	1.89	1.96	1.94	2.08	1.92	2.12	1.98	2.01	17.5	16.5

MR85 = Marlboro 85
ML6 = Marlboro Lights

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FIGURE 1
PUFF BY PUFF SMOKER VOLUMES ON MARLBORO 85 AMP MARLBORO LIGHTS CIGARETTES

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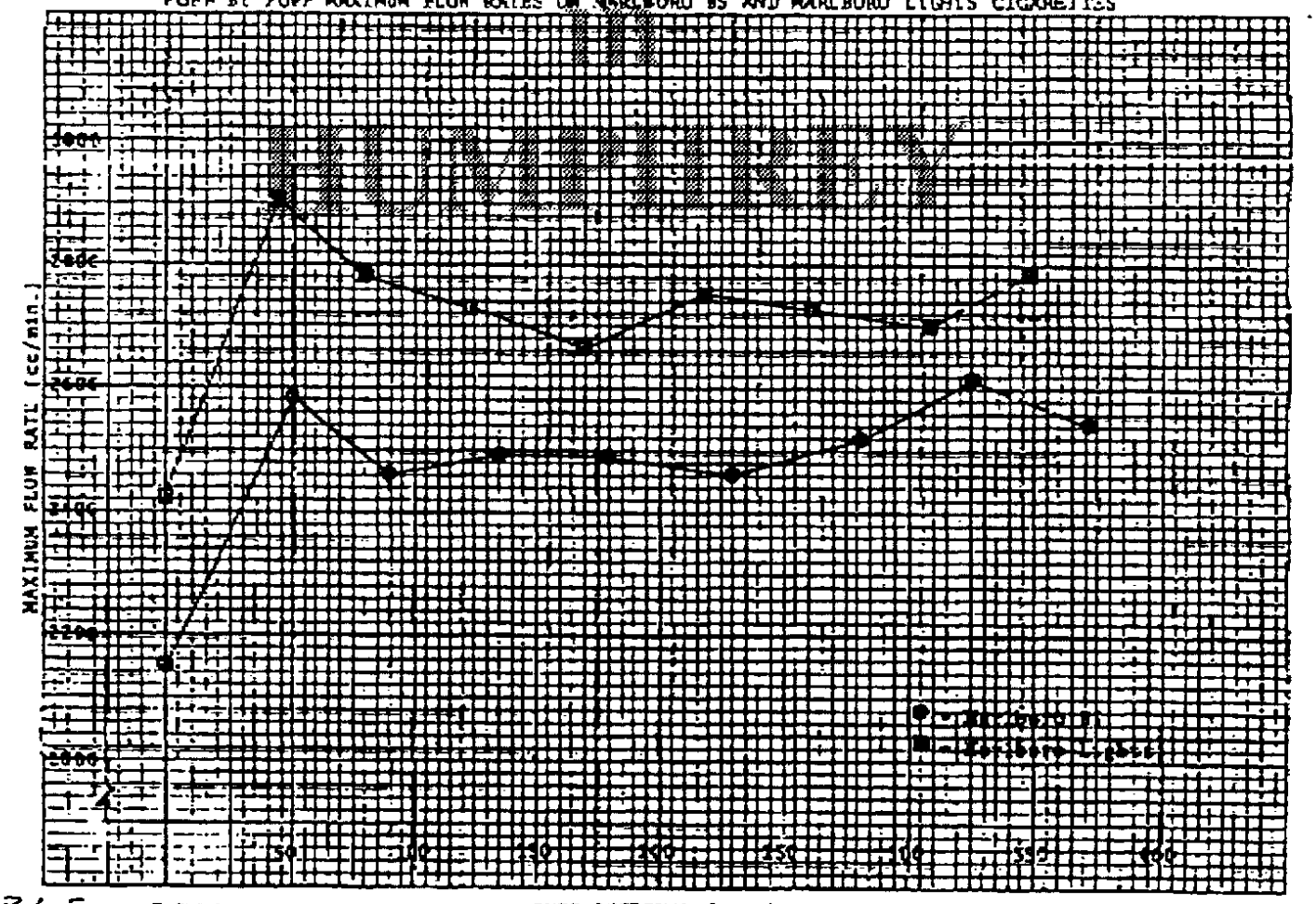
FIGURE 2

PUFF BY PUFF MAXIMUM FLOW RATES OF MARLBORO 85 AND MARLBORO LIGHTS CIGARETTES



B.L.S. Glaster

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FIGURE 3

PUFF BY PUFF DURATIONS ON MARLBORO #5 AND MARLBORO LIGHTS CIGARETTES

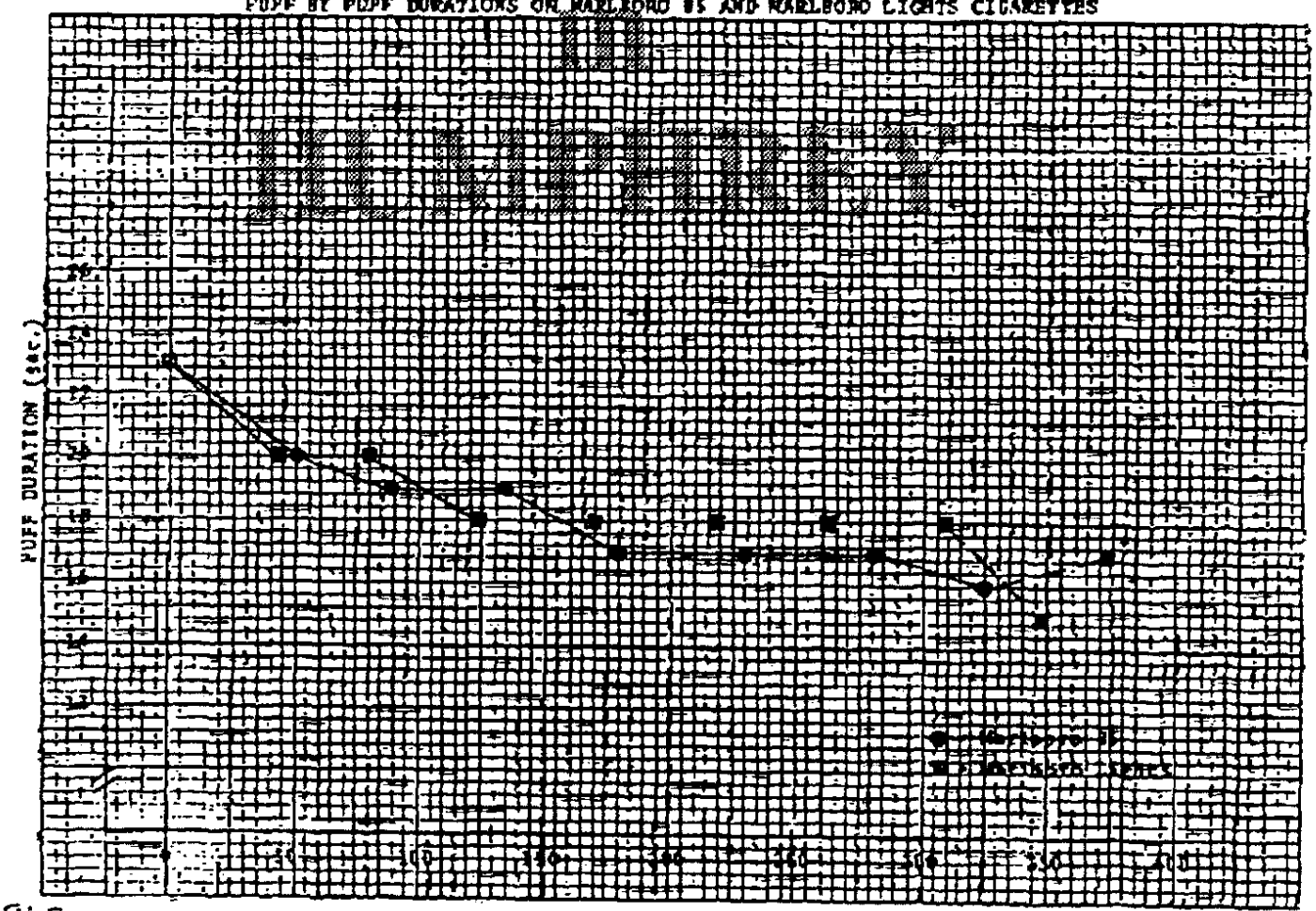

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FIGURE 4
INTERVAL BETWEEN PUFFS ON MARLBORO 85 AND MARLBORO LIGHTS CIGARETTES

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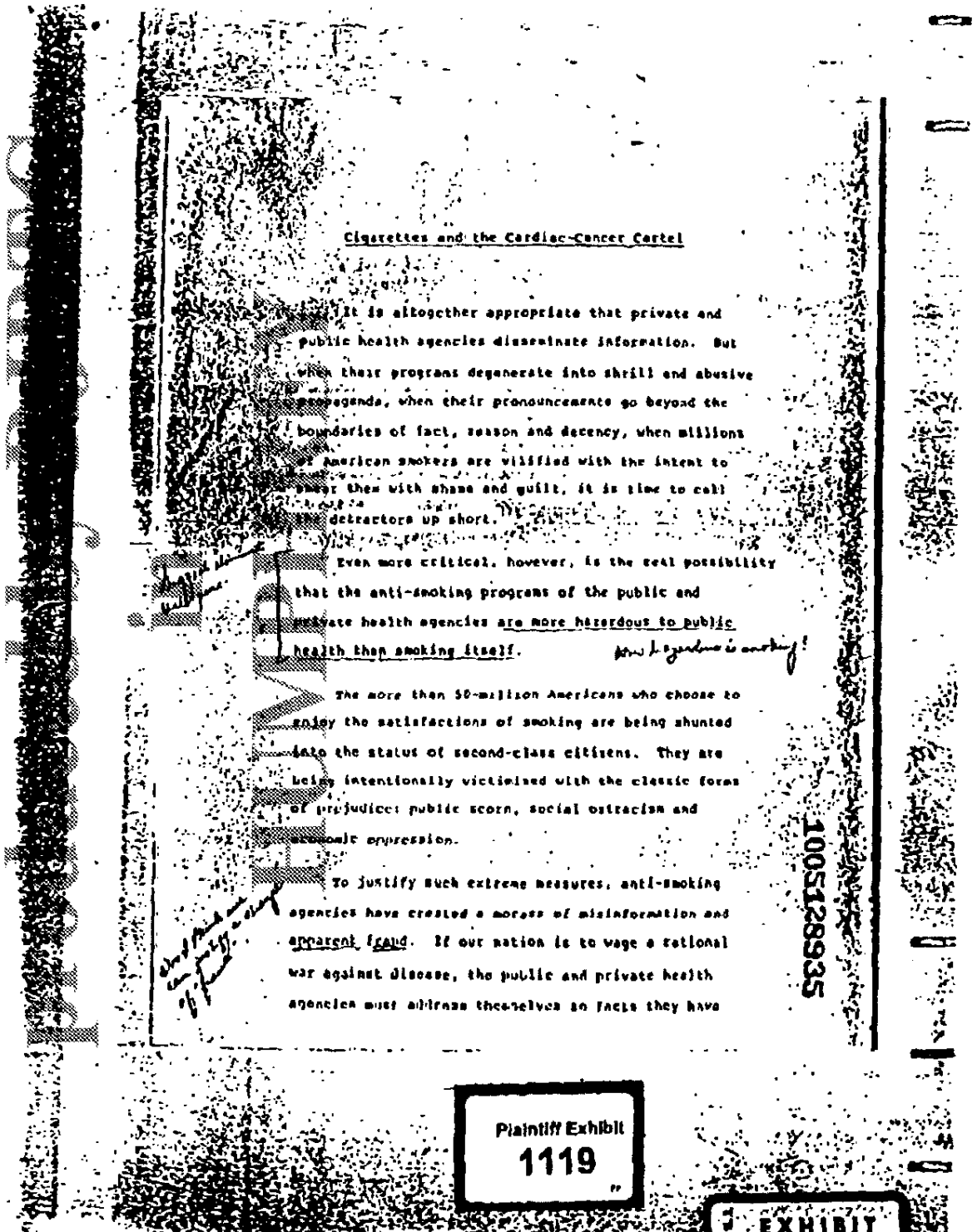

Cigarettes and the Cardiac-Cancer Cartel

It is altogether appropriate that private and public health agencies disseminate information. But when their programs degenerate into shrill and abusive propaganda, when their pronouncements go beyond the boundaries of fact, reason and decency, when millions of American smokers are vilified with the intent to smear them with shame and guilt, it is time to call the detractors up short.

Even more critical, however, is the real possibility that the anti-smoking programs of the public and private health agencies are more hazardous to public health than smoking itself.

The more than 50-million Americans who choose to enjoy the satisfactions of smoking are being shunted into the status of second-class citizens. They are being intentionally victimized with the classic forms of prejudice: public scorn, social ostracism and economic oppression.

To justify such extreme measures, anti-smoking agencies have created a morass of misinformation and apparent fraud. If our nation is to wage a rational war against disease, the public and private health agencies must address themselves to facts they have

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deliberately chosen to ignore or obscure. These facts should be disclosed to the public, or the so-called information and education programs will continue to be nothing more than Big Brother propaganda serving entrenched interests. The facts include:

Millions of smokers chose to smoke for psychological and physiological reasons. Known benefits of smoking include control of stress and obesity, two serious health problems. What would be the consequences if tobacco were banned or all smokers were convinced by the biased propaganda to quit smoking? Leading authorities, including the authors of the famous 1964 Surgeon General's report, have warned that the elimination of tobacco could be hazardous to public health.

The health agencies have assiduously created the myth that the physical case against smoking is closed. Yet there is no clinical evidence that cigarettes cause disease. If the agencies are truly interested in informing the public, why is this fact concealed?

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3. There is documented evidence that employers using cigarettes as the scapegoat for cases of lung cancer have continued to expose workers to carcinogens. As a result, employees, smokers and nonsmokers alike, have died. Such is the climate created by the health agencies.

4. The public has an exaggerated notion of how much the American Cancer Society, the American Heart Association and the American Lung Foundation spend on health research. It is considerably less, incidentally, than the tobacco industry contributes to independent health research. Has the public been deliberately misled?

5. Independent monitors have questioned the propriety of public appeals for more funds for research at the very time the private agencies have been enlarging their cash reserves and increasing their non-research expenses. These monitors suggest the public appeals are misleading.

6. Researchers who have findings that would seem to contradict the party line of the cardiac-cancer cartel have difficulty getting their papers published. Other scientists say it is difficult to get research funds to investigate

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ponsible other causes of disease. They say they can't "swim upstream."

7. The single piece of laboratory research said to conclusively prove that smoking causes cancer was an orchestrated hoax. It was the infamous "smoking dog" study, announced with public fanfare at a televised press conference by the American Cancer Society. The scientists who conducted the research have never released their data for independent review. Similar experiments by others have never duplicated the widely headlined "results." The ACS has since swept the spurious "smoking dog" story under its rug and never mentions it. As a measure of the standards of scientific integrity that pertain, the prepetrators of the hoax remain accepted and well-paid members of the cardiac-cancer cartel.

8. A large proportion of the grants by the private and public health agencies has been for research based on the preconception that smoking is guilty. This unscientific approach has failed abjectly to give the public scientific evidence as to the cause, prevention and cure of disease. The health programs are a shambles, and the responsibility lies at the door of its managers: the cardiac-cancer cartel.

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The cartel's characteristic response to failure is to intensify its propaganda against smoking. This may give the illusion of activity, but it is a smokescreen obscuring the fact that after spending hundreds of millions of public and private funds, the cartel has achieved no scientific breakthrough and has minimally advanced the understanding of the diseases that concern them.

9. There is an unholy alliance between the private and public agencies, with collusion in the acquisition and allocation of funds and a questionable "musical chair" exchange of executives. This cozy relationship between the heads of agencies in the public and private sectors would be deemed highly suspect in any other area.

10. The party line is dictated by this handful of well entrenched, comfortably ensconsed people wearing a purple cloak of power, prestige and rectitude. Their pronouncements are embellished, overladen with emotion and disseminated by a volunteer army of people, many of whom, despite their good intentions, can be described only as zealots.

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The cumulative result of all of those points has been a monumental, monolithic mindset that extends to the media and the medical profession. Media that customarily take an objective and skeptical stance in most controversies will unquestioningly report outlandish allegations against cigarettes. Many reporters and doctors have openly joined the anti-smoking crusade.

The ramifications should be embarrassing to the journalistic and medical professions, both of whom presumably pledged to objectivity. For example, the reported rate of lung cancer has increased though certainly not to the scourge proportions passionately predicted year after year. One neglected though obvious explanation is that lung cancer largely afflicts older people, and more people are living longer. And part of the recorded increase is undoubtedly the result of improved diagnostic techniques, a fact that in itself raises questions about the validity of the statistics.

Even more serious questions have been raised by autopsy studies. They invariably show that lung cancer has been overdiagnosed as a cause of death among cigarette smokers and underdiagnosed among nonsmokers. Clearly, the conventional mindset has produced inaccurate diagnoses -- that is, inadequate medical care -- for both smokers and nonsmokers alike.

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This critical fact is largely ignored by the media, medical publications as well as the general press, and is virtually unknown to general practitioners. How can it be in the public interest to keep the public and the medical profession ignorant of the facts?

The obsession with smoking has led many doctors to automatically, unthinkingly, advise all patients to stop smoking without any consideration of the loss of benefits. This runs directly contrary to enlightened medical practice, which is to treat the whole person.

In this way, the conventional mindset against smoking also ignores a fundamental principle of logic. A part may suggest something of the whole. But you must analyze the whole to arrive at a reasonable, valid understanding.

To condemn smoking in total on the basis of a statistical association between smoking and the incidence of lung cancer among a tiny fraction of smokers is far from logic and close to superstition.

The totality suggests something altogether different from the conventional mindset. Through the past four centuries, the enjoyment of smoking became common in every society to which tobacco was introduced. No one could reasonably deny that smoking serves some desire or need among millions of people. Nor is there any

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indication that it has been harmful to any society at large. To the contrary, the use of tobacco has become most common in industrialized societies that have achieved the highest standard of living and the greatest longevity.

The example of cigarettes, which are the primary target of the agencies and their attendant self-appointed critics, makes an even more dramatic point. Cigarettes first gained popularity near the turn of the last century. According to the mindset of the era, cigarettes caused tuberculosis, influenza, insanity, homosexuality among men and promiscuity among women. The New York Times, for one, editorialized that if cigarettes continued to catch on, there would be a veritable scourge. Cigarettes did continue to catch on, at a remarkable rate, and the general health of the populace has improved just as remarkably.

Since 1900, cigarette sales in the U.S. have risen from less than 3-billion cigarettes annually to more than 616-billion. During this period, average life expectancy has increased from 47 years to 72 years.

How consumption of cigarettes continued to grow despite such formidable opposition and campaigns waged on the two personal levels of morality and health is a sociological phenomenon never adequately analyzed nor sufficiently explained.

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The undaunted desire, perhaps a psychological need, among certain people to smoke must be reckoned with.

If, as is now seriously advocated, they are to be coerced into not smoking through punitive taxation, prohibitions and propagandistic smears of shame and guilt, a rational and decent society would determine first what is being denied to smokers.

This would require the admission that cigarettes provide some sort of benefit. From that admission, daring for today's acrimonious climate, inevitably issues the question of whether the benefits outweigh the perceived risks.

In most personal questions society reasonably leaves it up to the individual to determine the answer for himself, without coercion. Gastronomy, dancing and theater, pleasures once condemned as vices, are now condoned. Society permits people to fly airplanes in public, and to climb mountains and to ride bicycles in New York City, however abhorrently dangerous such acts may seem to some onlookers. Bathers, a fraction of whom drown, swim at beaches without punitive taxation. Joggers are regarded with approbation, although it is known that some suffer heart attacks. Marriage, the most momentous decision of a lifetime, remains a matter of personal discretion.

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A decent, libertarian society is committed to private choice rather than public fiat. It believes that the adult individual knows -- logically, psychologically, perhaps intuitively -- what is right for him. Individual freedoms are denied only when the larger interests of society overwhelmingly dictate the denial. The costs of such impositions of will on others are carefully weighed.

This clearly has not been done in the smoking-health controversy. One searches in vain among the anti-cigarette pronouncements and tracts for a hint that smoking induces benefits for a great number of people. The very real possibility that the loss of these benefits could have serious repercussions for individuals and society at large is never entertained by the health agencies.

Yet, ironically, there is a clear warning to that effect in the very report that is the cornerstone of the current campaigns against tobacco. In "Smoking and Health: A Report of the Advisory Committee to the Surgeon General" (USPHS 1964), an entire section is devoted to "Beneficial Effects of Tobacco." It states: "Evaluation of the effects of smoking on health would lack perspective if no consideration was given to the possible benefits to be derived from the occasional or habitual use of tobacco. A large list of possible physical benefits can be compiled from a fairly large literature, much of which is based on anecdote or clinical impression."

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As examples, it cites "maintenance of good intestinal tone and bowel habits" and "an anti-obesity effect."

The Surgeon General's report, however, gives greater emphasis to mental health benefits derived from smoking, pointing out that historically "man has always found and used substances with actual or presumed psychopharmacologic effects." Noting that tobacco smoking is a habituation, as distinct from an addiction, the report speculates on what alternatives smokers would turn to if tobacco were denied to them. It concludes with these portentous observations:

"If the thesis is accepted that the fundamental nature of man will not change significantly in the foreseeable future it is then safe to predict that man will continue to use pharmacologic aids in his search for contentment. In the best interests of the public health this should be accomplished with substances which carry minimal hazard to the individual and for society as a whole. In relating this principle to tobacco it may be reemphasized that the hazard, serious as it may be, relates mainly to the individual, whereas the indiscriminate use of more potent pharmacological agents without medical supervision creates a gamut of social problems which

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currently constitutes a major concern of government as indicated by the recent (1962) White House Conference on Narcotic and Drug Abuse."

This serious injunction from the cornerstone of their campaigns, in a classic case of censorship by selectivity, is absent from the pronouncements of the health agencies.

Since the 1964 report, an enormous amount of energy, passion and funding has been expended (1) to find physical evidence to support the hypothesis that smoking causes lung cancer and CHD and (2) to convince smokers to stop smoking. Success in attaining those objectives has been notably lacking. In the meantime, there has been virtually no research into the critical question of the risk/benefit ratio of smoking.

Leading medical authorities have protested such a narrow approach to such an urgent matter of public health. The Nobel Laureate, Professor Ulf von Euler, said that it is surprising that so little research has been devoted to the benefits of smoking. "Nobody would believe that so many people would use tobacco or products containing substances similar to nicotine unless it had positive effects," he said.

Professor Von Euler emphasized little is known about the effects of smoking on different kinds of individuals. Another eminent researcher, Dr. Carl

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Seltzer of the Harvard School of Public Health, says the evidence indicates that it would be dangerous for some individuals to give up smoking. That view is echoed by Dr. Walter Menninger, clinical director of the Topeka State Hospital, who says smoking relieves tension in certain types of individuals. If they don't get this relief, he says, they could well develop psychosomatic illnesses.

Since the 1964 Surgeon General's report, a new body of medical fact and opinion has emerged concerning the effects of stress in today's society. It is now widely accepted that stress is the progenitor of a number of other afflictions, including CHD and possibly cancer.

One of the world's foremost authorities on stress is Dr. Hans Selye, author of more than 600 scientific papers and 32 books. He has received innumerable awards and honors for original work in the prevention and treatment of disease.

In a paper on smoking and health, Dr. Selye declared that it is "frightening" that no one mentions the benefits of tobacco. "Man will always seek gratifying relief from stress," Dr. Selye said, "as he does from hunger, thirst or the sexual desire; our responsibility is not to lock up all avenues that may be dangerous, in proportion to their benefits. Only comparative studies of this kind are meaningful because, if a tense person who would normally

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... prevented from doing this, he will undoubtedly seek relief in some way which may be still more dangerous."

As one example, Dr. Selye cited evidence that overweight is as dangerous a risk factor for CHD as heavy smoking and observed ". . . It is a well-known fact that people who give up cigarettes often turn to overeating instead." [Dr. Christiaan Barnard, the renowned heart surgeon, recommended cigarettes to his daughter as a means of losing weight.]

Dr. Selye concluded his paper with comments that grow with relevance each day:

"I think it is very important to keep the public informed of the progress of studies on smoking, but this should be done with perhaps less over-dramatization. I am sure that often more damage is done by creating, through well-meant crusades of enlightenment, innumerable hypochondriacs whose main sickness is really the fear of sickness.

"We have seen many examples of this in medicine; for example, in connection with the so-called 'cardiac neurosis' which can make an essentially healthy man miserable all his life. Such an 'over-enlightened' anxious person has read so much about the dangers of heart disease that each time he feels a mild pain in his chest or an occasional abnormal heartbeat, he believes himself to be in imminent danger of death.

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"I wonder how many people who just could not give up smoking might have continued to lead a perfectly normal life had they not been plagued by fears of being not only in great peril, but actually sinful."

Dr. Selye's concern takes on additional significance in light of a massive new political and propaganda campaign mounted by the American Cancer Society last spring. Called "Target 5," the program in the first of its five years will involve the expenditure of more than $1-million to create anti-smoking media events and to lobby for anti-cigarette legislation.

Diverting the Society's efforts from research and science into the murky area of propaganda, both overt and covert, the program of course gives no consideration to the risk/benefit ratio of smoking. It is aimed directly at smokers, and its method is to instill blame, shame and fear among them. It attempts to make them second-class citizens in society, pariahs in their own families. One stated approach is to set children against parents who smoke. The possibility for psychological and physiological damage among the tens of millions of people who receive relief and enjoyment from cigarettes is ignored.

Tragically, the forgotten ones are the victims of the diseases the health agencies purport to be fighting. The profound sense of alienation among these victims is a growing cause of remorse among the medical profession. They tend to blame themselves for their afflictions, and

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members of their families tend to agree with them. The tactics of the health agencies can serve only to intensify their alienation at a time of deepest grief.

On what basis can organizations be justified in concerted efforts that, as Dr. Selye suggested, inflict psychological agony on members of our society? The agencies make the flat statement that smoking causes lung cancer and heart diseases. On the face of it, that is not a law of science. Most smokers suffer neither one of those diseases. Many nonsmokers do.

Grisly results of the rigid mindset engendered by the cardiac-cancer cartel are beginning to come to light. One example involves BCME [bis-chloro-methyl ether], a relatively new chemical important in the refining of low-grade uranium and other uses. At one stage in its manufacturing process, BCME is the most potent carcinogen ever tested.

For more than 20 years, BCME workers suffered an inordinate rate of lung cancer, but the cancer deaths were attributed by company officials -- and outside medical experts! -- to cigarettes.

Concerning a chemical plant in Bridesburg, Pennsylvania, an inspector from the Occupational Safety and Health Administration in 1971 glowingly noted in his official report: "Rohm and Haas recently completed 365 calendar

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During those 365 days, ten Rohm and Haas BCME workers had died of respiratory cancer.

By 1974, more than 50 employees who had been exposed to BCME in the plant had died of respiratory cancer, but the company resolutely and conveniently maintained that the deaths were not related to occupation. Finally, when it was clear that nonsmokers as well as smokers were cancer victims, one OSHA doctor commented that the company's insistence that smoking was the cause was "a meaningless argument to throw in; 60 to 70 percent of the working population smokes."

By July, 1975, the company had settled 27 compensation claims by survivors of workers who had died of cancer. An investigative article in the Philadelphia Inquirer's Sunday magazine, Today, reported that 50 employees have died of respiratory disease after exposure to BCME, and certainly there will be more.

To suggest that the Rohm and Haas incidents were isolated would defy common sense. In 1975, the National Cancer Institute issued an atlas showing cancer death rates for different parts of the country. The patterns of lung cancer bore no relationship to the patterns of cigarette smoking. The incidence of lung cancer was highest in areas of industrial concentration, particularly the East Coast and Gulf Coast. Commented Dr. Joseph F. Fraumeni of the NCI: "Something else is going on."

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The NCI atlas was called "surprising" when it was released, and then promptly forgotten. The war against cigarettes, characteristically, was intensified.

The atlas was hardly surprising to the epidemiologists who for years have noted that the worldwide statistics on lung cancer have no relationship to the nation-by-nation differences in cigarette consumption.

Among the states with the highest rates of lung cancer is New Jersey, whose large numbers of industries include chemicals and asbestos. Hard clinical evidence of a kind never developed against smoking has proven asbestos to be one of the most virulent carcinogens. Asbestos manufacturers are not quite ready to concede the fact, however, as long as the anti-cigarette mindset enables them to muddy the issue.

Recently a Congresswoman from New Jersey introduced federal legislation to enact a special tax on both asbestos and cigarettes. The tax would be used to compensate asbestos workers or their survivors when those workers have been afflicted by respiratory disease. Within the Congresswoman's district is Johns-Manville Co., one of the world's largest asbestos companies. Her legislation, it was discovered, was drafted by Johns-Manville lawyers.

As the number of clinically proven carcinogens has grown, the numbers of those with a vested interest in the anti-cigarette mindset have grown apace. More than

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Johns-Manville. More than a million workers have been directly exposed to asbestos and other carcinogenics in their occupations. Attempts to spread or divert the blame by exploiting the mindset manufactured by the cardiac-cancer cartel are understandable, though deplorable.

When one considers that hundreds of millions of dollars have been spent through the cardiac-cancer cartel with no discernible results, there is good reason to smell a scandal of major proportions. Such charges have been made by people in a position to know. One is Dr. Irwin D.J. Bross, Director of Biostatistics for the Roswell Park Memorial Institute, who testified on June 14, 1977 to the House Integovernmental Relations and Human Resources Subcommittee.

Dr. Bross pinned the failure of our nation's cancer programs on the hazy administrative superstructure that controls the National Cancer Institute, and he did not hesitate to name names:

"The superstructure was largely engineered and controlled by the American Cancer Society, a principal beneficiary of NCI funds. The liaison with the White House, Benno Schmidt, and the Director of the National Cancer Institute, Frank Rauscher, and many members of the National Cancer Advisory Board, such as Mary Lasker, all had close ties with ACS. This is also true, for that matter, for proposed replacements for Frank Rauscher (who moved from NCI to a better paid position as an ACS vice president). What the superstructure did was to

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concentrate power in a tight little professional in-group which then proceeded to run the Conquest of Cancer program as a closed corporation with a total disregard for the public interest.

"In any other areas of the federal government, this cozy set-up would have been regarded as very questionable or outright corrupt. This set-up is not worth revamping and should be junked. The American Cancer Society should be barred from getting any NCI grants . . . for the next four years."

Dr. Aross has been engaged in cancer research for 25 years and is a highly respected scientist, but his gravely serious allegations escaped attention in the press. Perhaps the media were sensitive to his implication that they were being manipulated:

"The programs for other environmental carcinogens are little more than public relations gimmicks, 'paper tigers' designed to reassure a concerned public that something is being done when it isn't. This is standard practice in the NIH [National Institute for Health]. The program on cigarette health hazards as a farce. It consists of noisy scare campaigns which are counter-productive -- like most of 'cancer education.' It sets up meaningless 'clearinghouses' to shuffle paper around -- a successful gimmick that is now used for chemical carcinogens. It will kill a lot of beagle dogs in a cruel and stupid experiment that will tell us nothing about human cancer. . ."

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At virtually the same time Dr. Bross was delivering his testimony ACS was launching its Target 5 propaganda program. At one of its so-called "hearings" for the press, it presented a young man who had held a hostage at gunpoint on the roof of a Los Angeles office building. He had refused to release his hostage until the media reported that his father had died from smoking. To the ACS, he was a hero. So much for science.

The stated objective of the target 5 program is to create social scorn for smokers. The implications of the program were clear to the Chicago Metro News, a black publication that is understandably sensitive to manifestations of oppression. In an editorial, it stated:

"If the ACS is allowed to continue in this direction of setting up 'veiled' rules for setting the lifestyle of citizens, the precedent will have been set for hundreds of organizations whose actions and programs are already suspect to openly get involved in setting up 'people restraints' geared to regiment the people in this country into a state of terror described by the author of the classic novel '1948' in which Big Brother determined the existence of all of the people of the planet." 1984

The concerted effort to stigmatize smokers as second-class citizens has been magnified into a furor over smoking in public places. From the earliest history of tobacco, the sight of someone smoking, just like the sight of someone of a different color,

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has been disagreeable to some people.

The Chicago Metro News has good reason to perceive bigotry in the growing constraints on smokers, because they are based on emotional antagonism, rather than reason. A comprehensive review of the research into the question of so-called "passive smoking" was conducted by the American Health Foundation and published in 1975 in Preventive Medicine magazine. The conclusion: "On the basis of available epidemiological evidence, it appears passive inhalation of tobacco smoke by nonsmokers or smokers does not increase their risk for chronic illnesses such as cancer of the respiratory tract, emphysema or cardiovascular disease."

Two articles supporting this view appeared in The New England Journal of Medicine in April, 1975. In "Concentrations of Nicotine and Tobacco Smoke in Public Places," a research paper by William C. Hinds and Melvin W. First of the Harvard School of Public Health, the authors concluded that "ambient cigarette smoke would not be expected to produce the strong public reaction to tobacco smoke that has developed in the past few years."

Hinds and First suggested that "annoyance from tobacco smoke is caused by factors other than the average concentration of particulate matter in the indoor atmosphere."

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In the same issue, Dr. Gary L. Huber of the Harvard Medical School wrote that "the nonsmoker passively exposed to tobacco may indeed have an adverse health response on a psychogenic basis." Thus even among the minute fraction of people who profess physical reactions to ambient smoke, the fundamental cause may be psychological.

How much this psychological distress is reinforced by unfounded charges by some of the health and propaganda agencies, notably the American Lung Association and Action on Smoking and Health, is a matter of conjecture. But innumerable nonsmokers have written letters to the editor stating the new shibboleth: "Your smoke is killing me." To the degree such people believe what they say, the propaganda causes distress and animosity. The frequency of such unsubstantiated charges in letters pages also brings up the question of editorial judgment. Against what other group than smokers would editors repeatedly print the unsubstantiated charge of killing?

The irrationality of the allegations is heightened by the fact that most public places are now air conditioned. A major government study, for example, dismissed the possibility of a health hazard from tobacco smoke in airliners. In planes with a typical ratio of smokers, it found the air cleaner than the outdoor air in urban environments. Another study came up with the same findings in air-conditioned homes.

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Yet the activists, not satisfied with the back-of-the-bus segregation of smokers, now want a ban on smoking in all public transportation.

As in the Salem witch trials, a large segment of society is acting on the basis of superstition when it mistakenly thinks it has the facts. The blame for this distortion of the public interest must be assigned to the health agencies, for society reasonably assumes these agencies deal dispassionately with facts and concentrate on conquering disease through research. Society has been intentionally misled. The agencies are more interested in the accumulation of money. A witch trial of smokers, whether it threatens public welfare or not, gets public attention, inflames the passions of volunteer fund raisers and produces big budgets and oversized reserves.

Research into the cause and cure of disease does not.

There is an independent nonprofit service for contributors, the National Information Bureau, that monitors the finances of "philanthropic" organizations. In its latest report on the American Heart Association, it states: "Question arises with respect to the reasonableness of AHA's accumulation of assets beyond the amount required for its next year's budget."

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Its reports on the American Lung Association and the American Cancer Society raised identical questions. With respect to the American Cancer Society, NIH further questions the fact that ". . . for many years the primary focus of the society's promotional and fund-raising materials has been on the need for funds for research, for which the percentile allocation has actually declined over this ten-year period."

NIH also found it strange that ACS assets increased from $76,500,000 to $186,800,000 during the ten years while it was claiming it didn't have enough money for research. Its report concluded: "NIH believes that it is misleading to the contributor for an agency to state that funds are not available if this 'unavailability' is in part a result of previously budgeted allocations and not based on actual funds on hand."

ACS spends 13% of its budget on fund raising, and more than 27% on "education" -- a large but undisclosed portion of which is the anti-smoking propaganda. "Education", of course, keeps ACS before the eyes of potential contributors, and ACS spends less on research than it does on education.

The handful of paid executives who run the ACS get salaries up to $75,000 a year. One of the new $75,000 employees is Dr. Frank R. Rauscher, who left the National Cancer Institute to become Senior Vice President for Research. Because ACS works closely

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with the government agencies, the propriety of such job switching has been questioned.

The American Lung Association is largely disdainful of research, which gets only 1.5% of its budget. The NIB report states: "Attention is called to the ALA's fund-raising costs." This seems justified. For every 1.5¢ ALA spends on research, it spends 20¢ on its fund drives.

ALA reports that it also spends about 28% of its budget on "education." To cite one example, this "education" takes the form of a scare booklet replete with unsubstantiated allegations and dire conjecture about the effects of tobacco smoke on nonsmokers. After attempting to frighten nonsmokers concerning the imagined perils (no scientific source is cited), the booklet advocates agitation for all sorts of restrictions on smoking in public places. The unscientific allegations are dutifully echoed by legislators who have found that anti-smoking declarations get them press coverage.

The ALA booklet also urges direct action against smokers: "Let family, friends, co-workers and strangers know you mind if they smoke." Also: ". . . voice objections when smokers light up without asking permission."

In other words, make one class of citizens beholden to another for the right to enjoy a simple satisfaction.

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And, of course, that right would be denied. Such militant attitudes have led to innumerable incidents of violence. Can this be the intent of people who contribute to an organization called the American Lung Association? Or do they expect a positive approach to solving the riddle of respiratory diseases?

The party line of the cardiac-cancer cartel has been adopted by dissidents in search of a cause, who have a penchant for setting up organizations with acrimonious acronyms.

Among the most active is ASH (Action on Smoking and Health), founded by Washington lawyer John F. Banzhaf III, Esq. Like more than 30 other organizations, ASH agitates for legislation restricting smokers. Mr. Banzhaf's motto is: "Sue the bastards!"

Another is SHAME (Society to Humiliate, Aggravate, Mortify and Embarrass Smokers). This group resorts to such measures as forcibly removing cigarettes from smokers' mouths. In restaurants they have dipped their hands in smokers' water glasses, righteously proclaiming that if air is to be polluted, so should water.

Thus the conventional mindset against smoking has degenerated into a KKK kind of vendetta against smokers. The onslaught has grown shrill, even hysterical, as the frustrated militants realize that they cannot impose their will on the more than 50-million Americans who continue to enjoy cigarettes. Ironically, the shrill

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and futile anti-smoking propaganda has proved to be eminently self-serving. If it achieved its pronounced purpose, which is inconceivable, the anti-smoker agencies and organizations would go out of business. To the degree that it fails, it generates more funds to increase the questionable caches of assets and to mount even greater "education" programs.

The noise level some time ago drowned the voices of reason. Millions of Americans obviously smoke because it serves some personal need. There is ample evidence that smoking is a safety valve in an increasingly stressfuly society.

The warning of the 1964 Surgeon General's Report is even more relevant today. Because the risks and benefits of smoking are not fully understood, it is altogether possible that the denial of the right to enjoy cigarettes would, on the whole, effect more harm than good to public health and welfare.

Even that, however, will remain a hypothetical question because it is unlikely, given the current state of the knowledge, that many smokers can be coerced into giving up smoking. More likely would be a recurrence of the malaise of the Prohibition era.

At heart, the issue is one of personal rights. Many smokers believe the benefits they receive from smoking outweight the risks they hear about so incessantly. They have a right to an open airing of

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the facts, not the monolithic mindset purveyed the cardiac-cancer cartel. And they have the right to decide for themselves.

In his masterly and classic essay, On Liberty, John Stuart Mill wrote:

"The opinion which it is attempted to suppress by authority may be true. Those who desire to suppress it of course deny its truth; but they are not infallible. They have no authority to decide the question for all mankind, and exclude every other person from the means of judging."

Mill's words strike to the heart of the question: Who has the authority to decide? As historians have pointed out, the most revolutionary idea in the Declaration of Independence was expressed in three words: "pursuit of happiness." Justice Brandeis explained that "happiness" in that context is not a mystical abstraction. It is the accumulation of the simple amenities, satisfactions and pleasures that relieve life of its grimness, meagerness and anxiety. Tyrants of that era had never entertained the idea that the masses should have such personal rights.

The efforts to deny their right to pursue the satisfactions of smoking add up to nothing less than tyranny by a minority.

--Clifford Nelson Smith

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GORI'S CONCEPT OF "SAFE OR SAFER" CIGARETTE IS NOT AGREED TO BY U.S. CIGARETTE MANUFACTURERS. IN OUR OPINION, THERE IS NO SATISFACTORY EVIDENCE OF HARMFUL EFFECTS FROM CIGARETTES PRESENTLY ON THE MARKET. GORI TAKES THE APPROACH THAT ELIMINATION OF SUBSTANTIALLY ALL PARTICULATE MATTER ELIMINATES POSSIBLY HAZARDOUS MATERIALS. THIS IS NOT THE VIEW OF THE INDUSTRY, ALTHOUGH CONSUMER DEMAND HAS RESULTED IN DEVELOPMENT AND MARKETING OF NEW BRANDS WITH LOWERED TPM DELIVERIES.

HOPE THIS ANSWERS YOUR INQUIRY.

REGARDS

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FROM: Joseph Field
RUDER & FINN INCORPORATED
130 East 59th Street
New York 22, New York
PLaza 9-1800

March 19, 1964

FOR: PHILIP MORRIS INCORPORATED

FOR IMMEDIATE RELEASE

PHILIP MORRIS MULTIFILTER - DRAMATIC ADVANCE
IN CHARCOAL FILTER CIGARETTES - INTRODUCED IN LEXINGTON

Smokers in Lexington were introduced this week to a dramatic new development in filter cigarettes.

Philip Morris Incorporated placed on sale its new Philip Morris Multifilter brand with a new multiple action system that uses specially processed activated charcoal granules in a totally different way.

Philip Morris Multifilter will be available in two packaging versions. The first is a red, white and blue soft pack, the second an elegant brown & red plastic Sport Pack.

Dr. H. R. R. Wakeham, Philip Morris Vice President for Research and Development, said "the new cigarette utilizes a new technique in using the scientific properties of charcoal, a recognized agent in purifying air, in the most efficient method developed to date. It exposes all the smoke to activated charcoal granules -- not some of the smoke, or most of the smoke, but all of the smoke."

Dr. Wakeham explained that "the activated charcoal granules have been suspended in a network of pure filter fibres throughout the extra long inner tube."

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Dr. Wakeham also noted that "a special flavoring agent restores and renews the true tobacco taste. Until the development of Philip Morris Multifilter, no cigarette was able so effectively to combine flavor with charcoal filtration."

In announcing distribution of the new product in this city, Ross R. Millhiser, the company's Vice President and Director of Marketing said "we have had more than a year's test experience with prototype brands," and that "this advanced new product incorporates the results of this prototype experience."

Mr. Millhiser also said that Philip Morris Multifilter was being introduced initially in Lexington because "smokers in the Lexington metropolitan market demonstrated a quick response to new product developments generally -- and an alertness and a willingness to try them."

Because of the significantly different developments embodied in the new cigarette, the Multifilter package has a special insert describing the action of the multi-filter system. The insert, found underneath the cellophane wrapping, reads:

"This filter system has multiple action. Activated charcoal granules are imbedded throughout the extra long inside filter -- a new technique in utilizing the properties of this accepted purifying agent. The Estron outer filter further filters the smoke while its special flavor agent restores rich tobacco taste."

In addition to the advanced filtration system and flavor retention, Philip Morris Multifilter comes in both a soft pack and the plastic Sport Pack developed last year by Philip Morris. The plastic packaging is produced by a vacuum-forming process on special high-speed machinery. The Sport Pack has high moisture, flavor and aroma retention qualities.

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The new Philip Morris Multifilter Sport Pack is in an elegant brown and red color combination. The Philip Morris crest is embossed on both sides of the package, which is made from oriented polystyrene and is seamless and reclosable. The plastic Sport Pack keeps the cigarettes factory fresh. With its replaceable cap, it also keeps tobacco particles from falling into pocket or purse.

The new cigarette will retail at popular prices. Its introduction will be heralded by advertising in all media, with emphasis on newspapers.

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PHILIP MORRIS
INCORPORATED
100 PARK AVENUE, NEW YORK, N.Y. 10017

Dr. H. Wakeham — date: August 23, 1973

from: R. Fagan

subject: Sommers' Suggestions

All the suggestions which are written as titles of proposed studies seem to be relevant to cancer research. Without protocols even in outline it is difficult to evaluate the proposals. Nevertheless, I will assume I know what Sommers has in mind and that I know the attitude of the Tobacco Working Group. With these assumptions I will try to make constructive comments and I will try to set the Sommers' suggestions in a priority system.

Priority of proposals - Number in parentheses is the number I've given to Sommers' individual suggestion.

a. Epidemiology (5,7,8,9)

Occupational synergy is suggested. Aside from the well-known ones of asbestos, radioactive dusts and gases, Sommers believes others should be looked for retrospectively. This has been done in the past but it is probably a good idea to keep looking at this aspect of the lung cancer problem. At the schools of public health of Harvard and North Carolina there are studies sponsored by the Union of Rubber Workers on occupational hazards. TWG might consider buying into these. Also, TWG might want to expand a study by NCI on neoplasia in chemists with emphasis on the subspecialties of chemistry and perhaps the specific chemicals the chemists are exposed to. Perhaps the ACS could become involved. Another such group is the production workers in various chemical industries. Saltzoff will have much to say on this topic.

Special groups are mentioned as worth study. These include women and blacks. A prospective study on these two population groups should be expanded to include immigrants as well as other minority groups.

Framingham data would be worthwhile mining for evidence of the relation of life-style with smoking and with respiratory disease. That population is relatively small but by this time there may be enough cancers of all types that might be investigated.

b. Virology and Immunology (2,3,4,10)

This popular topic is being investigated fully at the moment particularly by the Special Virus Group of the NCI. The new emphasis would be on the role of viruses as a synergistic

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influence on smoke. One great difficulty is the lack of a virus-free control group. Immunologic aspects particularly in diagnosis and prognosis and even therapy is receiving an enormous amount of attention. Sommers' suggestions would have to compete with many others proposals asking for funding.

c. Enzyme Induction (11,12)

These two suggestions appear as straightforward extensions of work already in progress. Suggestion #11 can be done in conjunction with work in suggestion #10.

d. Clinically-Associated Studies (1,6,13,14)

Suggestion #1 is a difficult one to discuss. If one considers neoplasms in general it is a well-known fact that individuals with some chromosomal abnormalities are at increased risk. These are people with known genetic abnormalities as indicated in the National Cancer Plan. Whether this is true of carcinoma of the lung is not known. To use a patient with lung carcinoma as a subject is making a determination after the fact rather than before the fact. This raises the question of who is a proper control and how long must the subject be followed.

Suggestion #6 is straightforward and could easily be implemented.

Suggestion #13 ought to be expanded to include other hormones in addition to parathormone. Several investigators have shown increases of hormones in lung cancer patients. What relation, if any, the increase levels have to do with onset or with prognosis is yet to be worked out.

Suggestion #14 has been partly studied--estimated growth rates on serial X-rays. However, this is only limited since for the most part when the diagnosis of lung cancer is made usually surgery is performed. Hence the number of measurements made to determine a growth curve would be very small. However, the few points would be worthwhile if this could be correlated with doubling-time studies on the tumor cells grown in vitro. Perhaps extrapolations could be made to evaluate therapeutic regimes with this technique.

It is refreshing to see that people close to the cigarette industry are willing to make concrete suggestions to arrive at the truth.

RJ/ero

R. Fagan

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PHILIP MORRIS BEHAVIORAL RESEARCH PROGRAM

I. EXECUTIVE SUMMARY AND SHORT CHRONOLOGY OF CNS RESEARCH

Philip Morris had been interested since the 1960s in the benefits of smoking and why people smoke. William L. Dunn directed the programs that Philip Morris implemented to study these issues. For many years Philip Morris internal research focused on smokers' smoking behavior and attempted to measure how smoking affected behavior. Problems arose, however, in designing controlled studies that limited subject variability and experimental conditions.

During the 1960s and early 1970s Philip Morris was also funding outside research that examined the benefits of smoking as measured in animals, although some researchers also employed human subjects as well. Between 1969-1972 Ronald Hutchinson studied the effects of smoking on aggression in humans as measured by jaw clenching. He also studied the effects of nicotine administration on aggression in monkeys. Gary Berntson was funded between 1972 and 1981, and his consultancy with Philip Morris continued through 1983. Berntson's work also involved investigating the benefits of smoking by studying the effects of nicotine on aggression in cats. He also examined the pain-reducing properties of nicotine in rats and cats. The last area of Berntson's research involved the effect of nicotine on learning and memory in rats and humans.

Robert Waldbillig was also funded by Philip Morris to investigate the effect of nicotine on aggression in rats. He was funded between 1974 and 1976.

These areas of investigation supported Philip Morris' view that smoking provided certain benefits to smokers, but there was no indication that Philip Morris intended to use any of the research results in commercial product development.

However, in 1977, Philip Morris began developing a program to identify a behavior or phenomenon that was measurably altered by smoke and was implicated in the reinforcement of smoking. In 1977, the Behavioral Research Program was restructured to include three units: General Experimental Psychology, Electrophysiology, and Comparative Psychology. The Electrophysiology and Comparative Psychology units were concerned with measuring the central nervous system (CNS) effects of smoking and nicotine. Frank Gullotta was hired to lead the Electrophysiology Program and to develop programs investigating the electrical activity within the CNS and how it was affected by smoking. Philip Morris wished to use the knowledge obtained from this research in strengthening its capability to develop new and improved smoking products.

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At least two projects stand out as efforts undertaken by Gullotta to develop data obtained from electrophysiological recordings to use in making new products. In one study Gullotta examined reports by some subjects that a high nicotine delivery cigarette seemed weak and a low nicotine delivery cigarette seemed strong. Gullotta recognized the commercial potential for developing cigarettes that appeared to produce the CNS effects of a high delivery cigarette by leading smokers to believe they were smoking a high delivery cigarette when they were actually smoking a low delivery cigarette.

Another project with stated commercial application was the development of the Olfactory Evoked Potential (OEP) recorded in response to olfactory stimuli. Gullotta and outside consultants attempted to differentiate flavor and odor stimuli in terms of amplitude, latency, and waveform morphology. This work was valuable to Philip Morris in its programs to develop flavors and Burley tobacco alternative and to reduce irritating factors in sidestream smoke.

At about the same time that the Electrophysiology Program was begun, Philip Morris began the Comparative Psychology Program under Carolyn Levy. The goal of this program was to understand the pharmacological effects of smoke by observing the effects of nicotine on behavior in animals. By 1979 the major objective of the animal behavior studies was to develop behavioral tests sensitive to the effects of nicotine and which could be used to screen nicotine analogues for CNS effects. In 1980, Philip Morris hired Victor DeNoble to use behavioral pharmacology techniques to investigate nicotine and nicotine analogues. Philip Morris undertook a Nicotine Program which included the coordinated activities of several Philip Morris programs such as chemistry, electrophysiology and behavioral pharmacology. The Nicotine Program's goals were to develop nicotine analogues that had desirable CNS effects without the undesirable peripheral nervous system effects. This goal had commercial potential of making new products.

In conjunction with Philip Morris' in-house Nicotine Program, Philip Morris also worked with outside researchers to aid its program. In 1979 Philip Morris funded research by Leo Abood to isolate and characterize nicotine receptors in rat brain. He was also consulted for his expertise in helping Philip Morris develop the prostration syndrome bioassay in its own research program. Abood was also contracted to test proprietary compounds developed at Philip Morris. In 1981 Philip Morris contracted with John Egle to test nicotine analogues for peripheral nervous system effects.

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For reasons never stated in any internal documents, Philip Morris cancelled the Nicotine Program in spring 1984. The decision to cancel the program may have been the result of outside counsel's legal advice.

Resources. Many Philip Morris internal documents were used to prepare this memorandum. The document identification number was cited along with the document's production history. The history stated whether the document had been produced, taken, placed on an exhibit list, or deemed privileged. The reference to "exhibit" following a case name indicated that the document was listed on the plaintiff's pre-trial exhibit list. It was not necessarily a trial exhibit. The same designation applied to a document described as "defendant's exhibit" meant the document was listed on the defendant's pre-trial exhibit list.

Many Shook, Hardy & Bacon memoranda were used to prepare this memorandum. For more information on a particular researcher's work, see the following:

Abood	Philip Morris Support for Leo Abood, July 1, 1986, Theresa R. Smith
Berntson	Gary G. Berntson: Philip Morris Sponsored Research, September 16, 1987, Nancy J. Anderson
DeNoble	Dr. Victor J. DeNoble, August 30, 1988, Kathryn L. Jones
Egle	Philip Morris Sponsored Research Performed by John L. Egle, Jr., Medical College of Virginia, July 10, 1987, Orville L. Barnett
Hutchinson	Ronald R. Hutchinson, September 8, 1987, Anthony J. Miella and Mary D. Sawyer
Waldbillig	Philip Morris Sponsored Research at Rockefeller University, September 22, 1987, Nancy J. Anderson and Mark Peterle.

Short Chronology.

Date	Event
1969	Hutchinson funded
1972	Berntson funded
	Hutchinson funding ceased
1974	Waldbillig funded
1975	Levy hired

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1977	Berntson hired as consultant
	Gullotta hired
	Electrophysiology and comparative psychology programs initiated
	Waldbillig funding terminated
1979	Abood funded
1980	DeNoble hired
1981	Egle funded
	Berntson research terminated
1984	Egle funding terminated
	DeNoble terminated
	Berntson consultancy lapses
	Abood funding terminated

II. INTRODUCTION

William L. Dunn directed the Philip Morris Behavioral Research Program. In 1969, Dunn's outline for the Annual Report indicated that the program was called Consumer Psychology at that time. This document demonstrated that Philip Morris had not yet begun CNS research, but was focusing on research designed to investigate smokers' smoking behavior in more general terms. A brief mention was made of a "rat project" with a goal of producing smoking animals in an effort to determine whether nicotine dependency could be produced in different strains of rats. No other details were provided. [1000344589-4596, Cipollone taken, all redactions removed]

By 1974, documents indicated that the program's name had changed to Smoker Psychology/Behavioral Research Program. The research conducted in this time period was designed to test several hypotheses focusing on how smoking could affect behavior. For instance, Philip Morris tested whether smoking improved efficiency or influenced aggression, learning or emotional arousal. Other studies tested whether changes in smoke deliveries affected puff patterns. These types of projects were carried out for several more years until 1977.

On December 1, 1976, Dunn outlined in the Plans and Objectives for 1977 a reorganization of the Behavioral Research Laboratory to include three units. These were the General Experimental Psychology Unit, the Electrophysiology Unit and the Comparative Psychology Unit. [1003293166-3171, Cipollone exhibit] Only research conducted in the Electrophysiology Unit and the Comparative Psychology Unit is within the scope of this memorandum. The General Experimental Psychology Unit will not be discussed here.

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III. IN-HOUSE RESEARCH PROGRAMS

A. Electrophysiology Program (Charge 1620)

1. Definition of Terms

In the discussion of the Electrophysiology Program, many technical terms were used. In an effort to aid understanding of this work, the following definitions are provided. All definitions were obtained from a Philip Morris document. (820705, 1003179058-9107 (p. 9060-9061), not produced)

AMPLITUDE - EVOKED POTENTIAL - The height of some component of the multiphasic EP waveform, measured either from a zero baseline, or with respect to another component.

AUDITORY PATHWAY - peripheral, pontomedullary, pontine, midbrain- In ascending order, the lower portion of the auditory pathway, extending from the inner ear and auditory nerve to the thalamus.

BRAINSTEM AUDITORY EVOKED POTENTIAL (BAEP) - Far-field auditory EP which is generated by neural elements located (principally) in the brainstem. It consists of seven peaks which occur within 10.0 msec after acoustic stimulation. Optimal stimuli are rarefaction clicks occurring between 10 and 30 clicks/sec.

CENTRAL NERVOUS SYSTEM (CNS) - The brain and spinal cord.

COMPONENT/PEAK - EVOKED POTENTIAL - One wave of the multiphasic EP waveform. Usually identified in terms of polarity (P or N) and either its normal latency or its ordinal relationship to other peaks (e.g., P_{100} or P_1).

EEG POWER SPECTRUM - Time series (fast fourier) analysis of the ongoing EEG. It yields numerical data about the amount and/or percent of energy at the various frequencies (i.e., 0 - 40 Hz) contained within the EEG.

ELECTROENCEPHALOGRAM (EEG) - A record of the continuing electrical activity of the brain. It is usually recorded from the scalp via gold or silver electrodes positioned over the brain areas under study.

ELECTROTRIGEMINOGRAM (ETG) - A record reflecting the depolarization of the free nerve endings of the trigeminal nerve. In this case, the ETG refers to the depolarization potential recorded from the inner, lateral surface of the human nose.

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EVOKED POTENTIAL (EP) - The electrical response of the brain to the onset of a sensory stimulus, such as a light, tone, odor, etc. In general EPs are small multiphasic waveforms which must be signal averaged to extract them from the ongoing (and much larger) EEG.

FAR-FIELD RESPONSE - EVOKED POTENTIAL - A response which is recorded distal to its neural generators. For example, the BAEP is a far-field response because, although it is recorded at the cortex, its neural generators are located in the brainstem. (The PREP is a near-field response, since its neural generators are in visual cortex).

FEELING FACTORS - IN CIGARETTE SMOKING - The spicy or peppery quality of smoke. Feeling factors are thought to be mediated by stimulation of the trigeminal nerve.

LATENCY - EVOKED POTENTIAL - The time from stimulus onset to the occurrence of some component (peak) of the EP waveform.

N_1-PREP - The first negative component of the PREP. Its normal latency is approximately 70.0 ± 3.0 msec.

OLFACTORY EVOKED POTENTIAL (OEP) - The cortically recorded response of the olfactory system to the onset of an odorant.

PATTERN REVERSAL EVOKED POTENTIAL (PREP) - The cortically recorded response of the visual system to a shifting pattern (usually a checkerboard).

P_{100}, P_1 - PREP - The primary positive component of the PREP. Its normal latency is 100.0 ± 5.0 msec.

RAREFACTION CLICK - IN BAEP RECORDING - A click produced by the inward movement of the diaphragm of an earphone. Rarefaction clicks are the preferred BAEP stimuli since they produce good peak resolution.

SIGNAL AVERAGING - EVOKED POTENTIAL - The process by which an evoked potential is extracted from the ongoing EEG. Since the evoked potential is time-locked to stimulus presentation, it can be computer summated. The ongoing EEG is random with respect to stimulus presentation and is averaged to zero. The number of stimulus presentations necessary to record a clear evoked potential varies with the signal (evoked potential) to noise (EEG) ratio.

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TRIGEMINAL NERVE - The fifth cranial nerve, widely distributed throughout the head and neck.

2. Objectives of the Electrophysiology Program

Beginning in about 1974, the Behavioral Research Program's stated goals for several years remained the same:

I. To learn more about why people smoke.
II. To learn more about how people smoke.
III. To identify what people want to smoke.
(1003293183-3185, Cipollone taken; 1003293177-3182, Cipollone taken; 1003293172-3176, Cipollone taken)

This research continued in an apparently general way until 1977 when another goal was introduced:

IV. To identify a quantifiable behavior or physiological phenomenon which meets these two criteria:

a. Is measurably altered by smoke inhalation.

b. Can be conceptually construed to be implicated in the reinforcement of the smoking act. (1003293166-3171, Cipollone exhibit)

To achieve its goals as outlined above in IV, Philip Morris recruited Frank Gullotta to join Philip Morris in 1977 and to set up the electroencephalography (EEG) laboratory. His task was to monitor the electroneurological events underlying psychological states. The program's goal was "to conduct research on human smoking wherein the dependent variable is an electronic signal mimicking a human physiological event. Since it is widely believed that the reinforcement of cigarette smoking occurs within the central nervous system, electrical activity from within that system will be the principle source of data." (1003293166-3171, Cipollone exhibit, emphasis added)

It was not until the Plans and Objectives for 1979 were written that any opportunity for commercial application of this research was mentioned. Dunn wrote that the program's objectives were to understand the reward a smoker gets, to understand the psychophysiological action of the reward, and to relate the reward to the constituents in smoke. This knowledge would "strengthen Philip Morris R&D capability in developing new and improved smoking products." (1003293151-3159, Cipollone taken)

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In the Plans and Objectives for 1981, Dunn outlined the individual programs in the Behavioral Research Program and stated that each "is but a varied attack upon the overall objective of the Behavioral Research Program to contribute useful knowledge about the response of the smoker to the cigarette and its smoke. The results may prove useful in developing a new product, or improving an existing product, or in the defense of the company from legislative or litigative harassment." [1003293130-3137, Cipollone taken, defendant's exhibit)

The specific objectives for Gullotta's electrophysiology program remained the same in 1981 as in previous years: to determine how smoking affected brain electrical activity and to identify the neural elements which mediated smoking's reinforcing actions. [1003293130-3137, Cipollone taken, defendant's exhibit] There follows a discussion of the major projects conducted by Gullotta in pursuit of the program's objectives.

2. Discontinued Studies

The following studies were discussed by Dunn in the Plans and Objectives for 1977 before Gullotta joined Philip Morris. [1003293166-3171, Cipollone exhibit) Gullotta pursued these studies, but they were evidently quickly abandoned as no further discussion was found in the documents.

a. Alpha Wave Habituation

By 1976, Philip Morris was aware of other scientists' research demonstrating that smokers adapted more rapidly to intrusive auditory stimulation than did deprived smokers. Philip Morris was interested in this research to determine whether smokers smoked to insulate themselves from disruptions. Dunn wrote that Philip Morris was interested in the possibility that these research results might be translated into an index to identify and assess the "critical components of smoke." [1003293166-3171, Cipollone exhibit) This reference to Philip Morris' interest in "critical conpounds" tacitly implied that the critical compounds could be manipulated in the development of new products.

Although it appeared that Gullotta did not pursue this line of research once he joined Philip Morris, he did plan to measure alpha brain wave frequencies and to observe changes associated with cigarette smoking. Gullotta planned to use cigarettes identical in all variables except nicotine content. [1003293160-3165, Cipollone taken) No further information was found.

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b. Contingent Negative Variation (CNV)

By late 1976, Philip Morris was aware of other scientists' research on CNV, a small prolonged change in the brain's electrical potential associated with mental processes reflecting mental alertness. In the Plans and Objectives for 1977, Dunn wrote that Philip Morris was interested in learning more about this phenomenon and the reports that CNV was modifiable by smoke inhalation. Dunn thought that the measure had potential as an index of the pharmacological response to smoke. [1003293166-3171, Cipollone exhibit] Gullotta planned to continue this project in 1978; however, he acknowledged that some subjects demonstrated an increase in magnitude of CNV while smoking, while other subjects demonstrated a decrease. [1003293160-3165, Cipollone taken] No further information was found.

4. VEP

This was Gullotta's first brain research study assessing the effects of smoking on electrical brain events in response to visual stimulation by a flash of light. In his first Annual Report covering the period July 1977-June 1978, Gullotta reported that smoking's effect on the Visual Evoked Potential (VEP), one aspect of the gross EEG, was not clear-cut. There was no effect on the early components of the VEP (representing sensory processing), but there appeared to be an enhancing effect on the late and after-discharge components of the VEP. Gullotta planned to replicate previously conducted, but inadequately controlled studies. [1000369448-9495, Cipollone taken]

Repeat experiments regarding the first VEP study did not show the same results. Gullotta was unable to resolve the differences in results; however, he pursued this research, but changed some of the methods. [1000365482-5522, Cipollone exhibit] The follow-up studies are discussed below in section 7, PREP.

5. Smoking and the EEG

In the Plans and Objectives for 1979, Gullotta proposed replicating studies examining the effect of smoking and nicotine administration on EEG activation. [1003293151-3159, Cipollone taken] Gullotta recorded ongoing EEG activity and began the process of developing a spectral analysis program to allow him to perform analyses of ongoing EEG data from a number of brain loci under varying conditions of smoking and smoke deprivation. [1003293138-3144, Cipollone taken] Because of technical difficulties this project was not started until 1981. [1003293130-3137, Cipollone taken, defend.'s exhibit] No more information on this study was found.

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6. AEP

Gullotta began studies of the Auditory Evoked Potential (AEP) in late 1979. Previous results had shown increases in the amplitude of the late components of VEP. Gullotta hypothesized that smoking and nicotine administration produced a generalized stimulant effect on the CNS. He predicted that all Sensory Evoked Potentials would be enhanced following smoking or nicotine administration. On the other hand, if Gullotta found a depressing effect on AEPs, he would conclude that smoking had a selective effect on the CNS, rather than a generalized enhancing effect. [1003293130-3144, Cipollone taken] He found that AEPs were not enhanced, and he therefore concluded that smoking had a specific and selective rather than a general effect on the CNS and that not all sensory systems were equally influenced by smoking. He speculated that it was possible that smoking may have different effects on the various neural systems which mediated behavior. His results did not support the idea that smoking had an overall arousal effect on the smoker. [1000385482-5522, Cipollone exhibit]

7. PREP

A study on Pattern Reversal Evoked Potential was begun in 1980. Gullotta had previously reported that smoking increased the amplitude of the late components of the VEP to flash stimulation. However, flash stimulation activated nonspecific brain structures as well as specific structures such as the primary visual cortex. To correct this problem, Gullotta employed another type of VEP called PREP by stimulating subjects with a checkerboard pattern to activate primarily visual structures and to study the effects on visual information processing. [1003293130-3137, Cipollone taken, defend.'s exhibit] This method was very reliable, and Gullotta conducted more studies, as described below.

a. PREP: Dose/Response, Deprivation and Time Factors

Gullotta had previously reported that smoking altered the Pattern Reversal Evoked Potential (PREP). He continued his studies to determine whether factors such as nicotine dose, smoke deprivation or time interval would also effect the PREP. He reported that high delivery cigarettes affected amplitude and latency; medium delivery cigarettes did not affect amplitude, but shortened latency only following deprivation; and low delivery cigarettes affected neither amplitude nor latency, irrespective of deprivation. [820705, 1003179058-9107, not produced]

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b. Repetitive Smoking and PREP

This study was a continuation of previous studies finding that high delivery nicotine cigarettes affected the PREP whether or not subjects were deprived and that medium delivery nicotine cigarettes altered PREP only under conditions of smoke deprivation. Low delivery cigarettes produced no changes. Gullotta wondered whether it was possible to mimic the effects produced by the higher nicotine delivery cigarettes by having subjects smoke several of the lower delivery cigarettes. Although Gullotta did not state so in his Annual Report, this study could have had commercial implications in that Philip Morris was attempting to determine whether a low delivery cigarette could produce CNS effects similar to those of a high nicotine delivery cigarette that a smoker would find more "satisfying." Philip Morris would be interested in the product development opportunities of this possibility. He reported that smoking three medium cigarettes resulted in a reduction in latency similar to that resulting from smoking one high delivery cigarette. However, no changes in amplitude were noted. No significant effects were obtained by smoking three low delivery cigarettes. Gullotta concluded that a threshold might exist between the low and medium delivery cigarettes. [820705, 1003179058-9107, not produced]

c. Perception and Smoking Effects on PREP

A very interesting study, and one with commercial application, was a result of observations that subjects might comment that a high delivery cigarette was weak or vice versa. Gullotta wanted to study the influences of the pharmacological and perceptual factors of smoking on PREP. Based on previous findings that smoking produced PREP latency shifts, Gullotta hypothesized that PREP latency shifts would reflect pharmacological factors, while amplitude effects would reflect both pharmacological and perceptual factors.

As predicted, results showed that latency changes reflected the nicotine delivery of the cigarette smoked. The amplitude measured the interactive effects of nicotine delivery and the smoker's perception. Results showed that either smoking a strong cigarette or smoking a weak cigarette that was perceived as strong produced amplitude reduction. The critical point regarding this study, although just a preliminary one, was that Gullotta stated that it may be possible:

> to alter CNS responses to cigarettes by altering how people perceive them. For example, we might be able to produce the CNS effects of high delivery cigarettes by leading subjects

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to believe they were smoking high nicotine cigarettes when they were actually smoking low nicotine cigarettes. Experiments of this type might have important implications for the marketing of low delivery cigarettes. (820705, 1003179058-9107 (p. 9083), not produced, emphasis added)

d. Analysis of Market-Brand Cigarettes Using PREP

Gullotta used the PREP to analyze the use of market-brand cigarettes. He was interested in comparing the effects on the PREP of both market-brand cigarettes and experimental cigarettes. He tested a number of commercial cigarettes with different nicotine deliveries to assess how well the data fit his hypothetical curves derived from previous studies. He found that under controlled smoking conditions, the latency shifted in a manner approximating what would be predicted on the basis of FTC nicotine deliveries. In contrast, however, he reported that Barclay cigarettes produced results at odds with what would be predicted on the basis of FTC nicotine deliveries. The results indicated that Barclay's actual delivery was higher than its FTC rating. Under ad lib Barclay smoking conditions, the latency shifts were slightly greater than those in controlled smoking conditions for Barclay. Gullotta interpreted his results to mean that smokers could achieve CNS effects with ultra-low delivery cigarettes comparable to those obtained with high delivery cigarettes. These data contradicted the common belief that people could not smoke ultra-low delivery cigarettes for nicotine. He suggested the possibility that smokers might modify their smoking behavior in order to obtain some optimal CNS levels of nicotine. He concluded that, "the PREP may be an extremely sensitive alternative method for addressing the actual nicotine deliveries of current and new brands, and for determining how smokers modify their smoking behavior in response to different cigarettes and brand modifications." (820705, 1003179058-9107, not produced) Gullotta continued this study into 1983, but results were not reported. (830629, 1003186659-6717, not produced)

e. Return to Baseline

In 1983, Gullotta reported the results of a study examining how long CNS effects endured following smoking a single cigarette. This work was related to Philip Morris' interest in the timing and rate at which cigarettes were smoked to determine whether CNS effects affected smoking rate. Smoking produced a significant decrease in PREP latencies which lasted ten minutes after smoking. Latencies did not return to pre-smoking baseline levels until 60 minutes after smoking. Gullotta concluded that the decreased latencies were short-lived, and that, theoretically,

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smokers may be smoking, in part, in response to CNS cues. [830629, 1003186659-6717, not produced]

8. BAEP

Gullotta also examined the effects of smoking on Brainstem Auditory Evoked Potentials (BAEP). An advantage of these brainstem potentials relative to more traditional forms of recording was that the nerves associated with the BAEP components were better known. For instance, Peak I was due to VIIIth nerve activity, etc. [1003?931?0-31337, Cipollone taken, defend.'s exhibit] Gullotta believed that BAEPs would be sensitive to smoking based on observations that smoking after long-term abstention produced clinical signs of brainstem dysfunction such as vertigo and ataxia and that novice smokers reported nausea, vertigo, and palpitations upon smoking. These were clinical symptoms of brainstem involvement which Gullotta wished to know whether or not were reflected in the BAEP. He also wanted to investigate whether BAEP amplitude depression could be related to the clinical signs of brainsten dysfunction as seen in novice smokers. [1000385482-5522, Cipollone exhibit]

Gullotta found that smoking did not decrease BAEP amplitudes. Amplitudes remained stable irrespective of smoking and/or deprivation despite the fact that in approximately 30% of the time subjects reported nausea after smoking a high delivery cigarette following deprivation. He concluded that the BAEP was not an effective means to assess smoke-induced signs of brainstem involvement. [820705, 1003179058-9107, not produced]

9. OEP

In 1982, Gullotta undertook a program with definite commercial application. He began a joint program with Dr. Ikeda of the Flavor Development Department and with German scientists to quantify how subjects responded to olfactory stimuli. PM had great interest in developing tobacco flavorings, investigating Burley tobacco alternatives, and reducing irritability factors in sidestream smoke; therefore, Gullotta developed an Olfactory Evoked Potential (OEP) program to explore the relationships among chemical properties of an odorant, the OEP, and the subjective response. Doctor Ikeda suggested that trigeminal nerve stimulants are often classed as irritating, but that small amounts of trigeminal nerve stimulation may create a desirable feeling factor associated with cigarette smoke. Gullotta engaged the German scientists to screen common flavorants to assess whether odorants with trigeminal properties had distinctive OEP characteristics. They found that odorants that stimulated the trigeminal nerve produced OEPs that were larger, more distinct and had shorter latency than those that did not. Philip Morris was planning to establish a laboratory to

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begin recordings at R&D. Gullotta began recording OEPs using CO_2, limonene, and a combination of both. He made plans to obtain OEP profiles for odorants of interest to the Flavor Department. They were to consider identifying and eliminating irritative factors in sidestream smoke. Another goal was to find acceptable Burley tobacco substitutes. [820705, 1003179058-9107, not produced]

In 1982-1983, Gullotta continued research on olfactory and trigeminal EPs. The objectives of the program were to develop and use new techniques to quantify physiological responses to smoke constituents and tobacco flavorings. A study was carried out with exposure to limonene (an odorant), methylsalicylate (a trigeminal stimulant) and combinations of these with CO_2. The stimuli were differentiated in terms of latency, amplitude and waveform morphology. Flavor research was conducted by outside German consultants with vanillin, CO_2, menthol and a combination of vanillin and CO_2. [830629, 10036659-6717, not produced] This was the last report of Gullotta's program found. No further information was available.

B. Comparative Psychology/Behavioral Pharmacology Programs (Charge 1610)

1. Definition of Terms

In the discussion below of Carolyn Levy's and Victor DeNoble's work, many technical terms were frequently used. In an effort to aid understanding of this work, the following definitions are provided. All definitions were obtained from documents authored by DeNoble.

ADDICTION - "Addiction" must meet the following criteria:
(1) disruption an on-going behavior occurs when addictive drugs are self-administered;
(2) behavioral changes occur upon the termination of drug administration;
(3) "addictive" drugs are preferred to more conventional reinforcers (i.e., food, water, saccharin, etc.). [800723, 1003060621, Cipollone produced; Rothgeb produced]

PHYSICAL DEPENDENCE - Characterized by an abstinence syndrome when the availability of various psychoactive drugs is abruptly terminated or when an antagonist is administered. This can be quantified and qualified by changes in schedule controlled behavior. [810824, 1002973585, 1002973586-3615 (p. 3612) Cipollone taken; Rothgeb produced; Shires taken; 1000040405-0410, Cipollone taken; Rothgeb produced; Shires taken]

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REINFORCER - A compound or event that: (1) an organism works to make available, and (2) that event or compound requires additional work. Many chemical compounds and physical stimuli can be self-administered (i.e., food, water, heat, saccharin) and are therefore considered reinforcers. (1003186527-6530 Rothgeb taken; Shires taken)

SELF-ADMINISTRATION - Technique used to determine the reinforcing properties of a compound.

TOLERANCE - (1) Metabolic - (also referred to as pharmacological) develops as a result of physiological changes due to the presence of the active agent, thus decreasing the effective concentration. Specifically, it may be caused by the following -

(a) result of pharmacokinetic factors which alter the effective concentration of the active agent at the receptor. These factors include: altered absorption, distribution, metabolic or elimination mechanisms.

(b) a decreased sensitivity of the receptor even though the concentration of the active agent remains the same. (1003060442, 1003060443-0503, Rothgeb produced)

(2) Behavioral - a diminished behavioral effect of a compound with repeated exposure to that compound without the inducement of metabolic tolerance. (1000040445-0451 Cipollone produced; Rothgeb produced)

WITHDRAWAL SYNDROME - Occurs upon termination of chronic drug administrations (i.e., ethanol, barbiturates, opiates, and psychomotor stimulants). The withdrawal syndrome can be measured as changes in schedule-controlled behavior. (1000040398-0401, Cipollone produced; Rothgeb produced; 1003060566, 1003060567-0598, Cipollone produced; Rothgeb produced; 1003175753, Rothgeb taken; Shires taken; 1003175754-5785, Rothgeb taken; Shires taken)

2. Objectives of Behavioral Pharmacology Program

The Comparative Psychology Program was initiated in 1977 under the direction of Carolyn Levy. The goal of this program was to conduct research on human smoking on the premise that if human smoking behavior was a function of the pharmacological effects of some component(s) of smoke, then the mechanisms supporting the behavior could be studied through the observation of the immediate, or short-term effects of the smoke component(s) upon the behavior of sub-human species. It was planned to use small rodents as subjects. (1003293166-3171, Cipollone taken, exhibit)

By 1979 Philip Morris' programs were really taking shape. The major objective of the animal behavior studies was to develop behavioral tests which were sensitive to the effects of nicotine

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and which could be used to screen nicotine analogues for CNS activities. The studies planned were nicotine discrimination, tail flick (measuring analgesic properties), monitoring motor activity, prostration syndrome, nicotine self-administration, and rat EEG. [1003293218-3224, Cipollone exhibit, defend.'s exhibit; 1003293151-3159, Cipollone taken]

The 1980 Plans and Objectives for the Behavioral Research Program outlined the programs for the Comparative Psychology program. Carolyn Levy was transferring to Philip Morris New York and her program was turned over to her replacement, Dr. Victor DeNoble. The two major objectives were: (1) to develop and use animal behavior tests to screen nicotine analogues and (2) to learn more about the reinforcing properties of nicotine. [1003293138-3144, Cipollone taken]

The possible commercial application of this research was evident in Osdene's statement that the "major goal of the Nicotine Program is to develop nicotine analogues which will have desirable effects on the central nervous system (CNS) without the undesirable effects of nicotine on the peripheral nervous system." [Redacted in Rothgeb] The Nicotine Program relied upon several other programs to accomplish this goal, including investigations of the chemistry, pharmacology, behavioral pharmacology and psychological effects of nicotine and nicotine analogues. [801130, 1003060638-0643, Cipollone produced; Rothgeb produced]

By 1981, the Comparative Psychology Program had been renamed the Behavioral Pharmacology Program under the direction of Victor DeNoble. The objectives were stated as follows:

> I. To develop a better understanding of the behavioral pharmacological actions of nicotine, particularly the action which reinforces smoking behavior.
>
> II. Develop the empirical evidence which differentiates nicotine from the classical abuse substances.
>
> III. Use behavioral pharmacological methods for evaluating the nicotine-likeness of nicotine analogues. [1003293130-3137, Cipollone taken, defend.'s exhibit]

These objectives were pursued using the following main areas of study: Self-Administration, Discrimination Task, Prostration Syndrome, Withdrawal Syndrome, and Tolerance. The remainder of this section will discuss the various research projects conducted under these broad categories.

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3. Termination of Behavioral Pharmacology Program

In July 1984, Patrick Sirridge of Shook, Hardy & Bacon wrote to Philip Morris' Assistant General Counsel Fredric Newman transmitting an analysis of DeNoble's published literature, unpublished manuscripts, and in-press manuscripts. [1005059920, Rothgeb privileged] The analysis concluded that "[r]esearch engaged in, as well as some possibly under consideration, by Philip Morris has undesirable and dangerous implications for litigation positions the industry takes in regard to smoking behavior. . . . In the final analysis, the performing and publishing of nicotine related research clearly seems ill-advised from a litigation point of view." [1005059921-9931 (p. 9931), Rothgeb privileged]

In spring 1984, DeNoble was terminated and the Nicotine Program was discontinued. Although there were no internal documents found stating the reasons why DeNoble and his program were terminated, it could be easily concluded that the unfavorable analysis of the program submitted by Philip Morris' legal counsel prompted DeNoble's termination and the program's cancellation.

4. Discontinued Studies

The following studies were conducted under the direction of Dr. Carolyn Levy who directed the Comparative Psychology Program and its successor the Behavioral Pharmacology Program until January 15, 1980. These studies were abandoned shortly after DeNoble joined Philip Morris. DeNoble was recruited by Philip Morris "to upgrade the behavioral pharmacology program." Discontinuation of these studies may well have been DeNoble's initial effort to improve this program.

a. Nicotine and Locomotor Activity

The activity monitoring studies were initiated to evaluate whether a measure of locomotion could serve as a screen for nicotine analogues. Previous studies had revealed that the following dosages of nicotine could suppress locomotor behavior: 0.05, 0.1, 0.2, and 0.4 mg/kg body weight. Basically this study had two objectives: first, to determine at what dose level nicotine produced the same effect as saline and second, to evaluate the effect of nicotine analogues.

The study revealed that nicotine produced a statistically significant decrease in locomotor activity on the first and second day relative to the saline group. On the third day a significant increase in activity was observed in the nicotine group, while on the fourth day the level of activity between the nicotine group

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and the saline group did not differ. Studies were then designed to determine whether the variation in activity for the nicotine group could be attributed to the development of tolerance. DeNoble found that the nicotine injected rats increased locomotor activity with increased exposure to nicotine. He concluded that "the effects seen in the first study were due to the development of nicotine tolerance. . . ." Nevertheless, DeNoble decided to discontinue the locomotor technique for two reasons: first, problems interpreting the changes in activity had arisen and second, it was felt that the results obtained from this technique would "not add significantly to our testing program." [800620, 1003060599-0619 (p. 0608); Rothgeb produced: 1000384296-4318 (dup), Cipollone produced]

b. Tail Flick Test

The tail flick test had previously shown that nicotine produced analgesia (the inability to feel pain although conscious) in rats. Preliminary results were reported by Carolyn Levy regarding the tail flick test which was being evaluated for its usefulness in screening nicotine analogues and its stereospecificity on tail flick latency. In initial studies, both S-(-)- and R-(+)-nicotine elevated rats' tail flick latencies and reduced responsiveness to the painful thermal stimulus. The results of this test supported previous findings that nicotine had an analgesic effect on rats. However, some of the doses produced muscle spasms. This led to the development of another test that could be used to determine the analgesic effects of nicotine. This second test utilized hot water as the stimulus to the rat's tail.

In general, the effects on tail withdrawal were clearly observable and easily quantified. However, accurate measurements were not always possible due to tail quivers and jerks. "More disappointing, however, was the lack of an observed analgesic effect induced by nicotine."

Due to the above mentioned difficulties the tail flick method was abandoned. [800620, 1003060599-0619 (p. 0608-0610), Rothgeb produced: 1000384296-4318 (dup), Cipollone produced]

c. Place Preference Paradigm

The premise behind this technique was: if given a choice, animals preferred to remain in places where they had previously had positive experiences. Testing conducted with morphine clearly illustrated that rats preferred to remain in the chamber where they had been injected with morphine. Due to its effectiveness in illustrating the reinforcing properties of morphine, this technique was evaluated for its usefulness in studying the reinforcing effects of nicotine.

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Rats that were given nicotine injections later failed to show a preference for either chamber. These results clearly demonstrated that nicotine's "reinforcing properties" were quite different from those associated with morphine. Thus, the place preference paradigm was not useful for assessing the potential reinforcing properties of nicotine and was discontinued. [800529, 1000045347-6355, Cipollone produced; Rothgeb produced; 800620, 1003060599-0619 (p. 3610-3614), Rothgeb produced; 1000384296-4318 (dup), Cipollone produced)

d. Cold Swim Test

In a stress mitigator study involving a cold swim test and its effects on rats' ability to cross a barrier in response to an electric shock, rats in groups pre-treated with nicotine and stressed in a cold swim had longer latencies to cross the barrier. Levy speculated that nicotine affected pain threshold and more experiments were planned to examine this possibility. [1003293314-3321, Cipollone taken, all redactions removed] This test was evidently abandoned, as no other reports were found.

5. Self-Administration

Philip Morris first began reviewing literature on nicotine self-administration in 1977 as part of the Comparative Psychology Program. Findings from non-Philip Morris research showed that rats could be trained to lever press for nicotine; however, none had clearly demonstrated that nicotine was acting as a reinforcer. [761201, 1003293166-3177, Cipollone exhibit] The 1980 Annual Report of the Behavioral Research Lab identified its first goal was to illustrate that nicotine functioned as an intravenously delivered reinforcer. Intravenous and intracerebral self-administration techniques were utilized to evaluate the reinforcing properties of nicotine and nicotine analogues. [800620, 1003060599-0619 (p. 0618), Rothgeb produced; 1003384296-4318 (dup), Cipollone produced]

a. Nicotine Self-Administration

In October 1980 DeNoble and Carron reported that nicotine self-administration tests had been initiated. The rats established nicotine self-administration at a dose of 32 ug/kg/injection. In order to determine whether lever pressing was maintained by the contingency established between lever pressing and nicotine delivery, saline was substituted for nicotine. The substitution of saline failed to maintain responding. When nicotine was reintroduced, lever pressing rose again to the previous levels. The data showed that animals maintained nicotine self-administration due to the nicotine following the response (response-nicotine

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contingency), rather than by other behavioral effects of the drug. From this study it was determined that nicotine could act as an intravenously delivered positive reinforcer. [801014, 1003060646-0655, Cipollone produced; Rothgeb produced]

Following confirmation that nicotine could function as a positive reinforcer, DeNoble identified the following studies as "essential":

(1) Study the dose-response curve under various schedules.

(2) Determine the effects of cholinergic antagonists and agonists upon self-administration.

(3) Determine the substitutability of selected analogues.

(4) Demonstrate the following:

(a) that nicotine self-administration does not interfere with on-going behavior and

(b) that termination of nicotine access for self-administration does not produce behavioral impairment, or alter self-administration of other reinforcers (i.e., food, water, saccharin, etc.). [801126, 1000085385-5392, Cipollone produced; Rothgeb produced; 810327, 1003060566, 1003060567-0598 (p. 0571-0581), Cipollone produced; Rothgeb produced]

In the 1983 Annual Report for the Behavioral Pharmacology Lab, DeNoble and Mele listed four indicators of the reinforcing effects of nicotine: "1) a greater number of lever presses when nicotine was response-contingent than when saline was response-contingent; 2) a greater number of responses on the nicotine lever than on the activity lever; 3) a systematic decrease in the number of contingent infusions when nicotine was delivered noncontingently; and 4) systematic changes in lever pressing as a function of the nicotine dose." [830601, 1003060364-0441 (p. 0371-0378), Rothgeb produced]

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(1) Effects of Fixed Ratio on Nicotine Self-Administration

DeNoble undertook studies to determine the effects of a fixed ratio (FR) size on both the response rate and nicotine intake. A fixed ratio refers to the number of responses required before the reinforcer is administered. [810327, 1003060566, 1003060567-0598, Cipollone produced; Rothgeb produced) Preliminary results revealed that the response rate first increased then decreased as a function of fixed ratio size. Further testing showed that lever pressing remained fairly consistent at a ratio of 6 and 7; an increase to FR 8 produced a decrease in lever pressing. The most crucial finding of this study was that the number of nicotine infusions and the resulting nicotine blood level remained relatively stable over several ratio schedules. This suggested that responding for intravenously delivered nicotine was maintained "at least in part by the nicotine blood level." [810824, 1002973585, 1002973586-3615 (p. 3597), Cipollone taken; Rothgeb produced; Shires taken) DeNoble concluded that when compared to responding rates for other intravenously delivered reinforcers, which were not specified, the nicotine rates were low, thus indicating that nicotine may be a weak reinforcing agent. [830601, 1003060364-0441 (p. 0378), Rothgeb produced]

(2) Effect of Mecamylamine or Hexamethonium on Nicotine Self-Administration

Rats were given pre-session treatments of two nicotinic cholinergic antagonists: mecamylamine, a centrally active compound, and hexamethonium, a nicotine antagonist which does not readily penetrate the CNS. Preliminary results showed that treatment with mecamylamine completely blocked the nicotine maintained responding. Treatments of hexamethonium had no impact on nicotine self-administration. (810327, 1003060566, 1003060567-0598 (p. 0581), Cipollone produced; Rothgeb produced) In January 1982, DeNoble stated that the results of pre-treating the rats with nicotinic-cholinergic antagonists had determined that the reinforcing effects of nicotine were centrally mediated. [820121, 1000084650-4657, Rothgeb produced]

This test was extended and the results completed in April 1982. DeNoble and Mele submitted a progress report which discussed the use of the following four compounds to block three neurochemical systems: hexamethonium, mecamylamine, naloxone (antagonist to narcotics), and haloperidol. The results using hexamethonium and mecamylamine were stated above. Pre-treatment with naloxone had no effect on nicotine self-administration. [820421, 1003060442,

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1003060443-0503 (p. 0453-0459), Rothgeb produced] The results obtained at Philip Morris confirmed that naloxone was not effective as an antagonist of the positive reinforcing effects of intravenously delivered nicotine. [830601, 1003060364-0441 (p. 0379-0387), Rothgeb produced]

Haloperidol, a dopaminergic antagonist, decreased nicotine infusions by 35% for one day. Dopamine had previously been implicated in the central nervous system's response to reward. These results suggested that the reinforcing properties of nicotine may be partially governed by the dopaminergic system. [820421, 1003060442, 1003060443-0503 (p. 0453-0459), Rothgeb produced]

b. Acetaldehyde Self-Administration

DeNoble and Carron issued a progress report to Dunn in which they stated that other smoke components--including acetaldehyde--were being investigated for their potential reinforcing properties. [1003175754-5785; Rothgeb taken, deposition exhibit] The objectives of the acetaldehyde self-administration tests included the following:

(1) Establish intravenously delivered acetaldehyde as a positive reinforcer;

(2) Obtain a dose response function under unlimited acetaldehyde access conditions;

(3) Examine the effects of fixed-ratio size on response rates and acetaldehyde intake; and

(4) Determine the changes in the uptake, storage, and release of cholinergic, catecholaminergic, serotonergic, and other neurotransmitter systems on self-administration of acetaldehyde. [p. 5754-5755]

Studies were initiated to determine whether acetaldehyde could function as a reinforcer by itself or whether it acted as an agonist or antagonist to the positively reinforcing effects of nicotine. Once lever pressing stabilized, saline was substituted for the acetaldehyde. After lever pressing for saline was stabilized, acetaldehyde was reintroduced. Acetaldehyde elicited 10.1 responses per hour while saline elicited only 4.75. Upon the reintroduction of acetaldehyde, the response rate returned to presaline levels. These results clearly demonstrated that acetaldehyde alone acted as a positive reinforcer. [810327, 1003060566, 1003060567-0598 (p. 0581-0586), Cipollone produced;

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(1) Effects of Dose on the Number of Responses and Acetaldehyde Intake

Acetaldehyde self-administration was stabilized in rats. Doses were then presented in ascending and descending order. The rats were kept at one dose for at least 7 days. No data were provided regarding ascending doses. However, the results showed that after a decrease in the dose the rats responded initially by increasing the number of responses and then decreasing. The relationships between dose, responding, and intake were similar to those obtained from other events which maintained behavior (i.e., food, water, saccharin, etc.). [820421, 1003060442, 1003060443-0503 (p. 0452-0453), Rothgeb produced]

(2) Effects of Fixed Ratio on Acetaldehyde Self-Administration

Ratio data were developed in order to evaluate the relative reinforcer effectiveness of a compound. This technique was run using only one rat. Results showed that the number of lever presses increased as a function of the ratio size up to FR 15. It was determined that the intake, measured as mg/kg/day, decreased over the first three ratios, then remained constant over the next five. When compared to acetaldehyde,

(-)-nicotine did not maintain lever pressing at these high ratios. This indicates that acetaldehyde, at similar doses to (-)-nicotine, is more effective at maintaining behavior. [820421, 1003060442, 1003060443-0503 (p. 0453); Rothgeb produced]

(3) Effects Of Haloperidol Or Naloxone Injections On Acetaldehyde Self-Administration

It was suggested that the reinforcing mechanism of acetaldehyde might be due to the formation of tetrahydroisoquinolines (TIQs), which are derived from catecholamines. TIQs were known to interact with a variety of membrane systems. More specifically, it was hypothesized that the effect of acetaldehyde on the CNS was mediated by the formation of TIQs. DeNoble decided to study TIQs and determine whether they could function as intravenously delivered positive reinforcers.

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The specific TIQs studied was carboxysalsolinol. DeNoble found that rats readily self-administered this compound at a high response rate, which was delivered at a dose of 160 ug/kg/infusion. Hyperactivity was observed in the animals with the main symptom being motor activation. When saline was substituted a gradual decrease in lever pressing was noted. Reintroduction of the TIQ caused responding to rise to the previous levels. DeNoble concluded that carboxysalsolinol was a very powerful reinforcer. [810824, 1002973585, 1002973586-3615 (p. 3604-3605), Cipollone taken; Rothgeb produced; Shires taken]

Additional efforts to develop an understanding of the reinforcing properties of acetaldehyde in the CNS involved blocking the endogenous opiate receptors and preventing the release of dopamine. Following this, the rats were infused with acetaldehyde. Once acetaldehyde was established as a reinforcer the rats were injected with either naloxone or haloperidol.

Treatment with naloxone, at doses of 1.5 and 3.0 mg/kg/ip, produced no major changes in the number of self-administered infusions. These findings suggested that the endogenous opioid system was not involved in maintaining acetaldehyde self-administration. Treatments of 0.5 mg/kg/ip haloperidol reduced the number of self-infusions to below the saline level. DeNoble found these results to be particularly interesting in light of the speculated role of TIQs acting as the reinforcing agent in cigarettes; however, he did not expand on this. [820421, 1003060442, 1003060443-0503 (p. 0453-0459), Rothgeb produced]

(4) Suggested Conversion of Acetaldehyde to Ethanol

In April 1982 Ray Dawson, consultant for Philip Morris, sent a letter transmitting his thoughts on the possible reinforcing mechanism of acetaldehyde. Dawson stated that although the behavioral aspects of nicotine and acetaldehyde self-administration were important, the biochemical factors needed to be investigated. One possible biochemical complication was the conversion of acetaldehyde to ethanol, followed by the accumulation of ethanol in blood, brain or some other organ.

Dawson suggested that due to the equilibrium constant of alcohol dehydrogenase (an enzyme that breaks down alcohols), acetaldehyde of whatever origin will be converted largely to ethanol (approximately 10 molecules ethanol for every 1 molecule acetaldehyde). Dawson also proposed that nicotine played a role in this conversion. He suggested that:

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the net effect of nicotine administration may be to elevate ethanol content of some organ, and of the co-administration of nicotine and acetaldehyde to elevate ethanol content still a little more in some additive fashion. [820415, 1003186525-6526, Rothgeb taken; Shires taken]

Dawson later wrote to Osdene regarding the possibility that acetaldehyde reinforced nicotine through its conversion to ethanol. [831228, 1000081609-1610, Rothgeb produced] Dawson suggested that "the effects of acetaldehyde as a reinforcing agent to nicotine may result from an in vitro conversion to ethanol." [831228, 1000081611-1613, Rothgeb produced] Apparently this suggestion was not actively pursued.

c. Nicotine-Acetaldehyde Self-Administration

DeNoble and Carron decided to study the combined effect of nicotine and acetaldehyde on self-administration. One reason for studying the self-administration of a combined nicotine-acetaldehyde was due to the fact that both compounds had positive reinforcing effects when delivered intravenously to rats. [820621, 1003060442, 1003060463-0503 (p. 0463-0466), Rothgeb produced]

The objectives were to:

(1) Examine the nicotine-acetaldehyde interactions on self-administration behaviors; and

(2) Examine the neurochemical correlates of the reinforcing properties of nicotine and acetaldehyde. [810327, 1003060566, 1003060567-0598 (p. 0568), Cipollone produced; Rothgeb produced]

In August 1980 DeNoble reported on the combined effects. The dose consisted of 4.0 ug/kg/infusion acetaldehyde and 4.0 ug/kg/infusion nicotine. The animals maintained responding at this combined dose. When the animals were given the same dose of each compound separately, responding behavior was not maintained. The combined influence of nicotine and acetaldehyde was greater than the two doses added together, suggesting a synergistic effect. [810824, 1002973585, 1002973586-3615 (p. 3603), Cipollone taken; Rothgeb produced; Shires taken]

The interaction between nicotine and acetaldehyde was determined to be a modification of the pharmacological effect of one

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compound by the other. DeNoble and Mele later reported that when either nicotine or acetaldehyde was removed from the mixture, the number of level presses decreased. This further supported the finding that when both compounds were functioning as reinforcers, they interacted. [820421, 1003060442, 1003060443-0503 (p. 0466), Rothgeb produced]

In the 1983 Annual Report of the Behavioral Pharmacology Program, DeNoble and Mele stated that they hoped to determine the optimal ratio(s) of nicotine and acetaldehyde combinations that would result in an enhanced positive reinforcing effect. Preliminary results revealed that acetaldehyde alone maintained responding at a higher rate than nicotine at equivalent mg/kg doses. Also, several combinations of acetaldehyde and nicotine maintained behavior above the levels of either compound when presented alone. They determined that the optimal reinforcing effect was obtained by 2-8 ug/kg nicotine added to 16.0 ug/kg acetaldehyde. [830601, 1003060364-0441 (p. 0388-0392), Rothgeb produced]

The fact that Philip Morris recognized commercial application of these findings was reflected in notes made at a meeting in which DeNoble presented information from research conducted on nicotine and acetaldehyde. It is believed that these notes were written by Judy John; they were found in her files and appeared to be her handwriting. John noted that both nicotine and acetaldehyde had been shown to be positive reinforcers and that these two compounds interacted. One goal of the research was to determine the maximal reinforcing ratio of acetaldehyde to nicotine. John also noted that data for nicotine and acetaldehyde predicted sales at 96% accuracy; however, the data to which John was referring to is not known. It is interesting to note that "additive effects accounts for 96% sales." This seemed to imply that smokers were buying and smoking cigarettes due to the acetaldehyde-nicotine content. John further noted that the higher each number for acetaldehyde and nicotine, the higher the predictability. Plaintiff could interpret these statements as indicating that Philip Morris was interested in achieving the optimal reinforcing ratio of acetaldehyde to nicotine in order to increase sales. [830628/E, 1003582081-2082, Rothgeb taken; Shires taken]

d. Frustrative Non-Reward

In the 1982 Behavioral Pharmacology Progress Report DeNoble and Mele discussed the frustrated non-reward (fnr) technique. The test involved establishing a fixed ratio in the presence of a white light, which was on until the ratio was completed and the reinforcer delivered. Upon completion of the ratio (fulfilling the number of responses required for the reinforcer to be delivered) and delivery of the reinforcer, the

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white light went out and two red lights came on. At regular intervals two correctly emitted responses were not reinforced. The lights switched, yet the reinforcer, in this case a food pellet, was withheld. This produced behavior which was counterproductive to obtaining the next reinforcer.

> The results show that (-)-nicotine, at the doses tested, had no effect on the induced behavioral change. However, acetaldehyde reduced the disruptive effects of food emission. In addition, the effect was dose related. [820421, 1003060442, 1003060443-0503, p. 0488-0489), Rothaeb produced]

Further discussion of these studies suggested that nicotine enhanced the fnr behavior. Compound 44, another smoke component tested, reduced the fnr behavior in a dose related fashion. This compound was probably acetaldehyde. [820512, 1002972797-2803, Rothaeb produced] Pages later noted that acetaldehyde apparently had some moderating effects on fnr behavior. [830816, 1002973179-3180, Rothaeb produced]

6. Discrimination Testing

a. Nicotine - Nicotine Analogue Discrimination

The discrimination task was utilized to determine the rats' ability to distinguish between two internally arising stimuli (interoceptive stimuli) produced by the compounds tested.

Philip Morris began work in this area as outlined in the 1978 Plans and Objectives. Carolyn Levy planned to study Discriminant Response Learning in animals where animals were trained to discriminate nicotine injections from saline injections. She wrote that since "nicotine's reinforcing action for smokers depends upon its action on the CNS, the nicotine discrimination paradigm is useful as a tool in screening compounds for their ability to produce nicotine-like CNS effects." [1003293314-3321, Cipollone taken, all redactions removed] Philip Morris was planning to use the same approach to study the nicotine cuing properties of d-nicotine and other alkaloids such as m-nicotine, anabasine, dihydro-m-nicotine, nornicotine, n-methyl-anabasine and myosmine, and acetylcholine. Philip Morris' goal was to determine whether the drug discrimination procedure would be valuable to screen nicotine analogues. Philip Morris anticipated learning about the central effects of nicotine and answering the question, "Is this compound like nicotine?"

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In a March 13, 1980, report, DeNoble identified four nicotine analogues which were to be tested for the production of nicotine-like interoceptive response. [1001521180-1182, Rothgeb produced; 800512, 1003293058-3060, Cipollone taken; Rothgeb produced; Shires taken The discrimination task had proven to be a very effective means for screening analogues and would continue to be used. DeNoble hoped to utilize the test more efficiently and therefore derive more information from it. [800424, 1003060644-0645, Cipollone produced; Rothgeb produced]

In July 1980 DeNoble reported that two nicotine analogues, dl-3-dimethylaminomethyl pyridine and 2'-methylnicotine, produced nicotine-like interoceptive responses. [800710, 1003293054-3056, Cipollone taken; Rothgeb produced; Shires taken; 800818, 1000128797-8804, Cipollone taken; Rothgeb produced; Shires taken]

2'-Methylnicotine produced responding in 100% of the animals at a dose of 0.4/mg/kg body weight; doses higher than this produced incomplete responding, identified as failure to complete the ratio in the time allotted. Studies were planned to determine the dose response curve using 2'-methylnicotine, in order to compare its potency to that od d,l-nicotine and l-nicotine. Additional tests were planned to determine the effectiveness of 2'-methylnicotine when the animals were given preinjections of mecamylamine or hexamethonium. The results obtained from this study would determine whether discrimination of 2'-methylnicotine was mediated centrally or peripherally. [800818, 1000128797-8804, Cipollone taken; Rothgeb produced; Shires taken]

Another nicotine analog, metanicotine, produced lever pressing in the animals. At a dose of 4.0 mg/kg, 50% of the animals responded with nicotine cues; when the dose was increased to 8.0 mg/kg, 100% of the animals responded. [801014, 1003060646-0655, Cipollone produced; Rothgeb produced]

By February 1981 two more analogues had been evaluated using the discrimination task. These analogues, d,l-N-methyl-2-(3-picolyl) pyrrolidine and d,l-N-methyl-beta-(pyridyl ethyl) pyrrolidine, produced nicotine-like cues; the doses required were 8-10 times the training dose of (-)-nicotine. [810211, 1003289229-9232, Cipollone taken; Shires taken; 1001400402-0405 (dup), Rothgeb produced]

Other analogues were tested in the discrimination task. It was found that cis 2'-methylisonicotine was inactive at all doses. At a dose of 3.2 mg/kg, trans 2'-methylisonicotine caused 33% of the rats to respond on the nicotine lever, 33% on the saline

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lever, and 33% failed to respond. Doses of 0.4 mg/kg - 1.6 mg/kg produced lever pressing on the saline lever in 100% of the rats. [810310, 1003289226-9228, Cipollone taken; Rothgeb produced: Shires taken]

In late 1981, it was decided that the discrimination task and intraventricular administration techniques would be used to develop a structure/activity relationship for the nicotine analogues. [811105, 1000084973-4981, Rothgeb produced]

The discrimination task alone was useful as a routine screen for behaviorally active nicotine analogues, but by April 1982 it was decided to employ several additional tests to better characterize their activity. It was planned to use these more sensitive measures to determine the relative potencies between the nicotine analogue and the duration of the effect in the central nervous system. [820421, 1003060442, 1003060443-0503, Rothgeb produced] However, no further reports were found.

b. Acetaldehyde Discrimination

In March 1981 DeNoble and Carron submitted a progress report to Dunn discussing the rationale underlying their efforts to establish an acetaldehyde discrimination study. First, acetaldehyde had been shown to act as an intravenously delivered reinforcer; second, the data indicated that carboxysalsolinol (TIQ) was also a reinforcer. In this study they hoped to determine whether the effects of acetaldehyde were similar to TIQs. [1003175753, 1003175754-5785 (p. 5768-5773), Rothgeb taken; Shires taken: 1003060566, 1003060567-0598 (dups) Cipollone produced; Rothgeb produced: 1000040398-0401 (partial dup) Rothgeb responsive but privileged [sent to Mr. Newman)]

The Behavioral Pharmacology Plans and Objectives for 1984 stated that the discrimination task, in conjunction with multiple schedule techniques, would be utilized to elucidate further the behavioral profile of acetaldehyde. [830906, 1003060131-0132, Rothgeb produced] No further data or results were found.

c. Nicotine-Acetaldehyde Discrimination

The self-administration tests had clearly shown that there was a behavioral interaction between nicotine and acetaldehyde. The discrimination study was undertaken to determine whether the interaction between nicotine and acetaldehyde was specific to self-administration or whether it could be extended to other behavioral tests. The animals were pre-treated with varying doses of acetaldehyde, and then the percent of nicotine-correct responding

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was determined as a function of each acetaldehyde pretreatment dose. "It appears that the pretreatment with the various doses of acetaldehyde did not improve the nicotine discrimination. In addition, it also appears that the pretreatment did not reduce the effectiveness of this nicotine dose (0.05 mg/kg/sc)." [830601, 1003178534-8615 (p. 8564), Rothgeb taken; Shires taken; 1003060364-0441 (dup), Rothgeb produced; 1005215287-5296 (partial dup), Rothgeb taken; Shires taken) In a handwritten summary of the 1983 accomplishments, it was concluded that:

> Blocking studies and discrimination tests suggest that acetaldehyde and nicotine are acting on separate neural systems. [1003177545-7546, Rothgeb taken; Shires taken]

3. Prostration Syndrome

DeNoble wanted to use the prostration syndrome, which was developed by Dr. Leo Abood, to determine the relative potency of nicotine analogues. DeNoble used rats that had been trained to lever press. [800424, 1003060644-0645, Cipollone produced; Rothgeb produced) Dr. R. A. Pages described the prostration syndrome as follows: after a 5 ug intraventricular infusion of nicotine, the rats went into a temporary "paralysis"; they had no control over their extremities, yet seemed to be aware of their environment. After about 5 minutes, the rats began to recover, they gained control over their limbs and were able to move around. After another 5 minutes, the rats recovered sufficiently to lever press.

A March 13, 1980, report stated that intraventricular injections of l-nicotine produced the prostration syndrome and that it appeared to be specific to nicotine-cholinergic activity. DeNoble used a behavior rating scale that had successfully been used to screen nicotine analogues for gross behavioral and CNS effects. [1001521180-1182, Rothgeb produced; information duplicated in May 12, 1980, report: 1003293058-3060, Cipollone taken; Rothgeb produced; Shires taken]

DeNoble later reported that both (-)-nicotine and (+)-nicotine induced the prostration syndrome, with (+)-nicotine being only 1/10 to 1/20 as active. The prostration syndrome was to be used to examine the relative potencies of nicotine analogues, particularly those that demonstrated nicotine-like effects in the discrimination tests. [800424, 1003060644-0645 Cipollone produced; Rothgeb produced] Studies were to be conducted to determine the sites of action, the extent of the behavioral prostration, and the effect of intraventricular injections of nicotine. [800620, 1003060599-0619 (p. 3618-3619), Rothgeb produced)

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a. Effects of Intraventricular Injections of Nicotine and Nicotine Analogues on Activity and Schedule-Controlled Behavior

Tests were run to compare the effect of 2'-methylnicotine with those of (-)-nicotine. It was found that 2'-methylnicotine was equally as active as (-)-nicotine. (800710, 1003293054-3056, Cipollone taken; Rothgeb produced; Shires taken) Although the prostration syndrome was very useful, it could not detect possible prolonged changes in the CNS. In contrast, schedule-controlled behavior was sensitive to CNS changes; it allowed for the development of a highly stable and reproducible baseline of behavior dependent on the integrity of the CNS. Rats that were nicotine infused displayed behavioral disruptions of 10-12 minutes post infusion. EEG readings taken by Dr. Leo Abood revealed that following intraventricular injections of nicotine rats displayed a recovery of baseline hippocampal activity at 10-12 minutes post infusion. These two pieces of data demonstrated that prolonged CNS changes had indeed occurred. (800818, 1000128797-8804, Cipollone taken; Rothgeb produced; Shires taken)

In an attempt to identify the neuroanatomical structures which mediated the prostration syndrome, Dr. Abood's assistance was enlisted. When Abood blocked several specific brain regions, he found that only the inhibition of the lateral vestibular nucleus caused the prostration syndrome to be blocked. (1002973585, 1002973586-3615 (p. 3605), Cipollone taken; Rothgeb produced; Shires taken) These results suggested that the prostration syndrome was mediated in the lateral vestibular nucleus.

b. Supersensitivity

Supersensitivity was defined as the "chronic inactivation of postsynaptic receptors in the CNS (which) produces an increased sensitivity (supersensitivity) of these receptors to the appropriate agonist." Due to the lack of data concerning this phenomenon, the Behavioral Pharmacology group decided to conduct studies to induce nicotinic receptor sensitivity in the CNS.

The prostration syndrome induced by nicotine was used as a behavioral index of supersensitivity. A preliminary test was conducted using one rat. The rat was given chronic doses of mecamylamine for 14 days. On day 15 the prostration produced by a low dose (2.5 ug) of nicotine was enhanced relative to that observed before chronic mecamylamine treatment. (820421, 1003060442, 1003060443-0503 (p. 0501-0502), Rothgeb produced)

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This test was later replicated using several rats. They were initially given a nicotine infusion, and the latency to complete the first ratio was measured. Then the rats were given chronic doses of mecamylamine. Upon termination of the mecamylamine dose, they received an infusion of nicotine and the latency was measured. This procedure of chronic mecamylamine treatment followed by a nicotine infusion was repeated once more.

> Chronic mecamylamine treatment failed to produce an enhanced behavioral response to nicotine. This suggests that under the conditions of the present study, chronic blockade of central nicotinic receptors did not result in an up-regulation (an increase in the number of post-synaptic receptors) that was detected at the behavioral level. [8588]

These studies were extended to include the "systematic manipulation of the dose, duration and type of receptor blocker administered, the dose and route of administration of nicotine, and the behavioral dependent variable," to delineate the functional significance of central nicotinic receptors in a variety of behaviors. [830801, 1003178534-8615 (p. 8584-8589), Rothgeb taken; Shires taken; 1005215287-5296 (partial dup), Rothgeb taken; Shires taken; 1003060364-0441 (dup), Rothgeb produced] In September 1983 this project was still active; however, no data were reported. [830906, 1003060331-0332, Rothgeb produced]

8. Withdrawal Syndrome

a. Termination of Nicotine

In November 1980 Dunn's plans and objectives for the Behavioral Pharmacology Lab included a proposed study to demonstrate "that termination of nicotine availability for self-administration does not produce behavioral impairment, or alter self-administration of other reinforcers. . . ." This objective clearly indicated an intent to show that nicotine was not an "addictive" drug and did not result in the development of physical dependence. [1000085385-5392, Cipollone produced; Rothgeb produced]

Dunn submitted the accomplishments to the Behavioral Pharmacology Program to Osdene in December 1980. In this report DeNoble expressed his views about termination of chronic nicotine administration.

> It is our belief that the magnitude of change observed on nicotine cessation reflects behavioral adjustments to the removal of a positive reinforcer, not a withdrawal syndrome.

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A study was designed which would determine what effect termination of chronic nicotine administration had on a rat's performance of a complex multiple fixed ratio fixed interval schedule. Changes in performance would be interpreted as reflecting changes in CNS integrity. [801223, 1003293284-3293, Cipollone taken; Rothgeb taken; Shires taken] However, DeNoble pointed out that the results obtained from this study would yield information regarding the possible withdrawal effects of nicotine, not cigarette smoking. [1003175753, 1003175754-5785, Rothgeb taken; Shires taken; 1003060566, 1003060567-0598 (dups), Cipollone produced; Rothgeb produced; 1000040398-0401 (partial dup), Rothgeb responsive but privileged (sent to Mr. Newman)] From the results obtained, it was concluded that "there is not a physical dependence produced by chronic nicotine administration." [810603, 1000040405-0410, Cipollone taken; Rothgeb produced; Shires taken]

In a later experiment, rats were given chronic nicotine doses and then challenged with mecamylamine. "The mecamylamine challenge had no effect on the schedule-controlled behavior, indicating an absence of physical dependence on nicotine." There were plans to repeat these tests because of the significance of the findings. [810824, 1002973585, 1002973586-3615 (p. 3611-3613), Cipollone taken; Rothgeb produced; Shires taken]

> [T]he absence of a withdrawal syndrome in this and other animal studies . . . combined with the lack of consistency in the data on humans suggests a more general interpretation, such as a learning mechanism whereby the interpretation of a well learned response that leads to positive reinforcement results in a variety of behavioral physiological changes which are reported by humans and are interpreted as withdrawal syndrome. [820421, 1003060442, 1003060443-0503, Rothgeb produced]

Shortly after this report, Charles submitted the Plans and Objectives for 1983 to Osdene which contained the following objective.

> Behavioral Pharmacology . . . studies on nicotine and acetaldehyde regarding reinforcing effects, physical and behavioral dependence and the development of tolerance will contribute vital information for the design of a product with the most desirable smoke properties. [820728, 1003479455-9461, Rothgeb taken; Shires taken]

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This could be interpreted by plaintiff as evidence that Philip Morris was concerned primarily with trying to develop a marketable product with maximal reinforcing properties.

b. Termination of Acetaldehyde

In the June 1983 Annual Report of the Behavioral Pharmacology Lab, DeNoble and Mele discussed the results obtained from studies on the termination of chronic acetaldehyde administration. Two procedures had been used to determine whether termination produced a withdrawal syndrome. The first study involved iv infusion of acetaldehyde (3.0 mg/kg) every 20 minutes for 10 days. Saline was substituted for two days. The acetaldehyde was then reintroduced at 6.0 mg/kg every 40 minutes for 20 days. The animals were observed during the saline periods for any signs of withdrawal, such as apprehension, tremor, piloerection, impaired motor activities, convulsions, or loss of appetite.

The data revealed that neither food intake nor activity was altered when saline was substituted. DeNoble concluded that "termination of chronic acetaldehyde administration does not result in a withdrawal syndrome. In addition, observations by three individuals failed to detect any overt signs of a withdrawal syndrome."

In the second, more sensitive procedure, rats were trained to lever press under an FR 32 schedule for a food pellet. Once established, the rats were infused with acetaldehyde every 20 minutes over a 24-hour period. Food was available under an FR 32 schedule for 15 minutes every 2 hours, 45 minutes. This procedure allowed observation of multiple samples of behavior within the 24-hour period previously shown to be sensitive to drug withdrawal.

> The failure to find any disruption in food reinforced lever pressing when chronic acetaldehyde was terminated across several doses and across several dosing schedules is strong evidence that chronic acetaldehyde intake does not result in physiological dependence. In addition, this data [the results discussed above], combined with previous data shows that acetaldehyde does not interact with an endogenous opioid system. [830601, 1003178534-8615 (p. 8565-8570), Rothgeb taken; Shires taken; 1005215287-5296 (partial dup), Rothgeb taken; Shires taken; 1003060364-0441 (dup), Rothgeb produced]

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c. Termination of Nicotine-Acetaldehyde Combination

In October 1983 a study was performed to determine whether termination of chronically administered nicotine-acetaldehyde combinations resulted in a physiological dependence syndrome. No disruption in food reinforced lever pressing upon termination of chronic nicotine-acetaldehyde administration was observed. This provided strong evidence that chronic exposure to the combination of compounds did not result in physiological dependence. (831005, 1003060631-0633, Rothgeb produced)

9. Tolerance

Tolerance was defined as a diminished effect of a substance with its repeated administration. Two mechanisms that may have caused pharmacological tolerance were suggested. The first mechanism involved pharmacokinetic factors which altered the effective concentration of the active agent at the receptor. The second mechanism involved a decrease sensitivity of the receptor, even though the concentration of the active agent at the receptor remained unaltered. (1003060442, 1003060443-0503 (p. 0489-0500), Rothgeb produced)

a. Behavioral Tolerance and Metabolic Tolerance

In October 1980 DeNoble and Mele submitted a progress report to Ogdens. An extension of the prostration syndrome testing had led to studies on tolerance. The findings which prompted these studies involved the following: rats that had been infused with 5 ug l-nicotine were then given twice the dose, 10 ug. The infusions were administered at least 7 days apart, and it was noted that the daily response rate varied less than 15% from day to day. DeNoble and Mele observed that the duration of the suppression in the response rate produced by the 10 ug dose was shorter than the length of suppression produced by the 5 ug dose.

The most likely explanation of these results was that behavioral tolerance had developed. "Behavioral tolerance is a diminished (behavioral) effect of a compound with repeated exposure to that compound without the induction of metabolic tolerance." In order to study this, the requirement for reinforcement was increased from 16 to 32. Once the rats were stabilized on the FR 32, they were infused during the daily session with 5 ug of nicotine on two occasions, 5 days apart. The second infusion of nicotine had a diminished effect, suggesting that some degree of tolerance had developed. DeNoble planned a series of studies which would more accurately characterize the development of tolerance. (801014, 1003060646-0655, Cipollone produced; Rothgeb produced)

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DeNoble's Plans and Objectives for 1983 included two proposals which dealt with tolerance. The first study involved examining the interaction between behavioral and metabolic tolerance induced by chronic nicotine exposure. The research was designed to examine the relative contributions of metabolic and behavioral influences on the development of tolerance. The second study focused on developing a behavioral profile of nicotine-induced tolerance utilizing the cross tolerance method. By using this method, DeNoble would obtain information about the nature of tolerance mechanisms in the CNS. In addition, these data would be used as a basis for determining the specificity of nicotine analogues in producing nicotine-like activity in the CNS. [820000/E, 1003186551-6554, Rothgeb taken, Shires taken: 820720, 1003060135-0140, Rothgeb produced; 1003060155-0160 (dup), Rothgeb produced]

DeNoble reported the preliminary results of a study being conducted to determine the interaction of behavioral and metabolic tolerance following chronic nicotine administration. He found that after 26 days of chronic nicotine administration at a dose of 0.8 mg/kg/sc, rats showed signs of tolerance. This testing was to be continued until tolerance was complete. [820827, 1001400456, Rothgeb produced]

b. Influence of Behavioral Factors on the Development of Tolerance

In April 1982 DeNoble and Hale suggested that tolerance might be influenced by certain behavioral factors (i.e., learning or performance). One factor which influenced the development of tolerance was whether or not the compound disrupted on-going behavior such that the rate of frequency of reinforcement delivery was altered. It had been determined that tolerance was more likely to occur, or would occur more rapidly, if the compound produced a loss of reinforcement as opposed to the reinforcement frequency remaining unaffected. [820421, 1003060442, 1003060443-0503 (p. 0498), Rothgeb produced]

In the 1983 Behavioral Pharmacology Annual Report, Hale stated that the development of tolerance to many of the behavioral and physiological effects of nicotine after repeated administration was well documented.

> At the present time, however, it is unclear whether the development of tolerance to the behavioral effects of nicotine is due to altered concentrations of nicotine at the receptor

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> (pharmacokinetic tolerance), to altered sensitivity of nicotine receptors (pharmacodynamic tolerance), to certain behavioral and environmental factors, or to some combination of the above.

The test used to determine whether behavioral factors were involved in the development of tolerance to nicotine was the before/after dosing paradigm. This technique involved chronic dosing two groups, one before and one after the experimental session. The performance of the group dosed before the session was altered, whereas the performance of the group dosed after the session was not altered. Following the development of tolerance in the before group, the after group was given the nicotine pre-session to test for tolerance.

> Nicotine decreased response rates averaged over the total 30 minutes . . . and response rates during the first six minutes of the session . . . in a dose dependent manner. Reductions in response rates were most pronounced during the first six minutes of the session, indicating that some recovery occurred during the latter portions of the session. The dose-effect functions for the before and after groups were similar.

The reductions in response rate for the before group on day 1 of chronic dosing were similar to those obtained initially. The magnitude of the response rate reductions decreased over sessions of chronic tolerance. No impact was made on the responding rate of the after group. They determined that after 30 days of chronic dosing, the before group was more tolerant to nicotine than was the after group.

In an effort to gain further data on tolerance, the decision was made to determine whether the after group had developed any tolerance to nicotine. In order to do this, the effects of (-)-nicotine on day 31 of the chronic dosing period were compared to those obtained during the initial dose-effect study. Results showed that the reductions in response rate on day 31 were slightly, yet significantly, smaller than the reductions observed initially. These results indicated that some tolerance had developed with chronic post-session dose-effect determination which suggested that some degree of tolerance persisted in each group.

The findings obtained from this series of tests suggested that the development of tolerance to nicotine had two elements.

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The major factor involved was a behavioral adaptation of the organism to the disruptive effects of nicotine on the schedule-controlled responding (behavioral tolerance). A secondary factor, considered to be fairly minor, was the effect of nicotine on FR responding which arose following the chronic administration. This secondary component may have reflected pharmacokinetic and/or pharmacodynamic mechanisms, however, further studies would have to be conducted in order to reach a definite conclusion.

The main conclusion reached in these studies was that tolerance developed to a greater degree in the group receiving doses before the session than those which were dosed after.

> [T]he development of tolerance to nicotine appears to be highly dependent on factors arising from the nicotine-induced disruption of FR responding, rather than on factors resulting from the mere repeated administration of nicotine.

c. Cross Tolerance

Cross tolerance was defined as a state which exists between two substances when the establishment of tolerance to one substance results in tolerance to the second substance. [820421, 1003060442, 1003060443-0503 (p. 0500-0501), Rothgeb produced] Testing was conducted on the nicotine analogue 2'-methylnicotine. The rats were first given 5 ug of l-nicotine; five days later the rats received 5 ug of 2'-methylnicotine. The results showed that the 2'-methylnicotine produced less suppression of the response rate under FR 32. These findings suggested that there was cross tolerance of 2'-methylnicotine to l-nicotine and/or a diminished peripheral effect. [801014, 1003060646-0655, Cipollone produced; Rothgeb produced] Dunn later confirmed that the results from the schedule-controlled behavior had shown the 2'-methylnicotine to have cross tolerance with nicotine. [801111, 1003293045-3048, Cipollone taken; Rothgeb produced; Shires taken]

Testing was conducted using two isomers of nicotine: (-)-nicotine, the naturally occurring isomer and (+)-nicotine, the unnatural isomer. This study was designed to provide data on the relative contribution of central and peripheral nicotinic receptors underlying the behavioral effects of stereoisomers of nicotine. The results indicated that the optically pure isomers of nicotine differed primarily in potency. [830601, 1003060364-0441 (p. 0408-0410), Rothgeb produced]

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IV. SPONSORED RESEARCH

A. University of Rochester (Abood)

1. Overview

Philip Morris corresponded with Abood and cultivated a relationship with him throughout 1978 before sponsoring his research in 1979. Abood had had several years of CTR grants for his CNS research, but Philip Morris had expressed concern about the nature of his CTR work and about some of the implications of his stated goal to find an antagonist to nicotine. Nevertheless, Abood terminated his CTR grant work and signed agreements with Philip Morris for its sponsorship. Philip Morris funded Abood with a grant, hired him as a consultant for his advice on the Nicotine Program, and contracted with him to study proprietary compounds developed by Philip Morris.

There was no documentation reflecting why or when Abood's grant, consultancy and contract were terminated. On March 7, 1984, Philip Morris sent $40,250 to the University of Rochester to cover the first six months of the sixth year of Philip Morris' grant to Abood. [1000027311-7312, not produced] On March 8, 1984, Abood submitted a progress report for the period January 1983 to April 1984, with a request for continuing support into 1985. [1002973383-3392, not produced] Evidently, at least six months of Abood's proposal for the period 1984-1985 was funded. No other documents were found. Abood's work with Philip Morris may have ended in mid 1984 after Philip Morris cancelled its Nicotine Program.

2. Association with Philip Morris

Osdene attended a meeting at CTR on November 22, 1977, where there was a discussion regarding CNS research sponsored by CTR. At this meeting, Leo Abood made a presentation regarding his CTR research grant to localize and isolate nicotine receptors and to characterize their biochemical make-up. [1000036595-6596, not produced] Philip Morris had grave concerns concerning the stated aims of Abood's research to make a clinically acceptable antagonist to nicotine. In a January 10, 1978, memorandum, Osdene wrote that, "This goal would have the potential of putting the tobacco manufacturers out of business." [1000036519-6520, Cipollone privileged]

Considering Osdene's view of Abood's work, it was not entirely clear why Osdene opened a dialogue with Abood. Nevertheless, over the course of 1978, Philip Morris and Abood

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corresponded and arranged visits. On January 25, 1978, Osdene arranged to visit Abood accompanied by other Philip Morris scientists. [1000127938, not produced) Abood made arrangements to visit Philip Morris in June 1978. [1000127937, not produced) One clue that Philip Morris was considering Abood's, as well as other scientists', possible contribution to the Philip Morris Nicotine Program was evident by Seeman's March 15, 1978, memorandum to Osdene in which he expressed his opinion that an effective Nicotine Program required both peripheral and CNS bioassays. He stated that CNS studies represented the most complex state of the art concepts. Seeman mentioned Abood's development of the prostration syndrome bioassay and other work related to the isolation and characterization of nicotine CNS receptors. Seeman's point was that outside researchers including Abood could help Philip Morris' research plan, but that Philip Morris "must devise not a shopping list for todays needs but a policy for the program as a whole." [1000128660-6661, Cipollone taken, defend.'s exhibit) It was possible that despite Philip Morris' discomfort with Abood's CTR work, Philip Morris still recognized Abood's leadership in this area of research and wished to learn and to improve its own Nicotine Program.

A June 22, 1978, memorandum from Ahrensfeld to Holtzman reported that Abood had approached Philip Morris directly, "with no instigation," about a consulting position, because Abood "was tired of the infighting at CTR and thought that he would resign." Ahrensfeld's memorandum reported his discussion with Seligman that Ahrensfeld and Holtzman "were under instructions to preserve the integrity of the industry with respect to CTR . . . (and) it would be improper for us to give the impression that we had attempted to wean (Abood) away from CTR." Ahrensfeld outlined two positions that were acceptable to take in developing a relationship with Abood. One course was that if Abood voluntarily resigned his position with CTR, after passage of a reasonable period of time, Philip Morris could enter a consulting agreement with Abood. The second course was that if Abood voluntarily resigned and, before the passage of a reasonable period of time, Abood was approached by NIDA or another tobacco company, then Philip Morris could enter an agreement with Abood. [2015056747-6748, Cipollone privileged; dups 2015062701-2702: 2010070367-0368]

In August 1978, Abood informed Osdene that Abood had been visited by CTR representatives regarding "his future contract." Abood told CTR representatives that he wanted to terminate his work, and CTR asked him to submit a renewal proposal which it would then reject, "since the proposal will involve CNS work which is outside the guidelines set for the CTR program." Abood felt he could then start any new program in January 1979. [1000127935, not produced]

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Abood's reference to new work in January evidently referred to a draft proposal under consideration by Philip Morris for sponsorship. Osdene suggested funding Abood in a combination of three ways: a grant, a consultancy, and a contract. [1001800009, Cipollone produced; dup 1000127930, not produced]

Osdene recommended a grant to Abood to continue his search for sites and mechanism action of nicotine in the brain. The first-year funding would be about $60,000 and would be largely unrestricted.

For his consultancy, Abood would be paid $300/day on an ad hoc basis for advice regarding Philip Morris' Nicotine Program, particularly in the area of Behavioral Psychology and Physiology.

Osdene recommended a contract with Abood to have him test specific compounds developed at Philip Morris and in which Philip Morris had a proprietary interest. The purpose of the contract was to "retain absolute control over the disposal of any data generated on these compounds."

In November 1978, Osdene informed Abood that he thought that his CTR contract would be renewed. Abood replied that he would "turn it down." [1000127934, not produced] A somewhat cryptic note written by Osdene a few days later reported a telephone conversation among Seligman, Osdene, and Ahrensfeld. Ahrensfeld said that, "he will go along with this as long as it's a bona fide deal." [1000127933, not produced] Osdene also recorded the decision: "Wait to contact Ed Jacob who is polling industry re support of Abood." [1000127933, not produced] No other documents clarified this note.

On December 7, 1978, Abood sent Philip Morris a revised proposal entitled, "Characterization of Brain Receptors for Nicotine and Nicotine-like Peptides Present in Brain." [1003289985-9989, Cipollone taken] On December 18, 1978, Osdene met with Abood and Philip Morris lawyer Carl Adkins in New York to discuss mechanisms of funding this proposal. It was decided to keep the proprietary areas within a contract or consultancy. The "synthetic work," i.e., the testing of Philip Morris synthesized compounds, would be done under contract. Osdene stated his preference to make a grant to Abood rather than a gift to the University of Rochester. Adkins stated, "Do not bring Univ[ersity] into grant." Abood felt it was "best to avoid rights under grant to Univ[ersity]." [1000127990, not produced]

In odd contrast to the discussion of December 18, a memorandum from Carl Adkins to Seligman on January 4, 1979, stated that the grant would be to the Center for Brain Research at the University of Rochester. Adkins reported that in the draft letter

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to Abood accepting his research proposal, Adkins did not insist upon certain rights such as control of publication of results, absolute confidentiality, and exclusive use of any inventions or discoveries arising from the research. He stated that these rights would have to be negotiated with the University administration and that "in view of the small likelihood that anything of commercial value will result from this particular research," it was decided to avoid delay by undertaking more negotiations. [1005141428, not produced]

The December 7 proposal was accepted by Seligman in a letter to Abood on January 15, 1979. This letter outlined the terms for Abood's grant proposal. The Philip Morris funds would be used for no other purpose than for Abood's research described in his proposal and that all information obtained through the research would be available to Philip Morris. Furthermore, any information furnished by Philip Morris to Abood would be returned upon request. The letter also stipulated that Philip Morris had rights to any invention or discovery resulting from the research. [1000127877-7880, not produced]

In another letter on February 28, 1979, Seligman outlined Philip Morris' acceptance of Abood's grant and Philip Morris' intention to hire Abood as a consultant and as a contractor to test proprietary compounds. [1000127884, not produced]

J. Commercial Application

That Philip Morris recognized and was interested in the commercial application of Abood's work was clear from statements made in Osdene's August 1978 review of Abood's proposal and in Seligman's January 15, 1979, letter to Abood. Philip Morris went to considerable effort to ensure that Abood's work was controlled by the three mechanisms outlined above. It was determined that Abood had no NIDA funds for any of his work involving nicotine. [1001800009, Cipollone produced: dup 1000127930, not produced] Osdene also noted that the contract with Abood should allow Philip Morris to retain absolute control over the disposal of any data generated on experimental compounds.

After the first year of Abood's grant was completed, several Philip Morris scientists commented on the benefits that his program brought to Philip Morris. J.L. Charles, in a March 18, 1980 memorandum, stated his opinion that nicotine was a "powerful pharmacological agent" and had been cited as "'a reason for smoking.'" For these reasons:

> [O]ur ability to ascertain the structural features of the nicotine molecule which are responsible for its various pharmacological

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properties can lead to the design of compounds with enhanced desirable properties (central nervous system effects) and minimized suspect properties (peripheral nervous system effects). There are many opportunities for acquiring proprietary compounds which can serve as a firm foundation for new and innovative products in the future. [1003289974-9975, Cipollone exhibit; dup 1000127793-7795, not produced]

Charles wrote that the receptor program at the University of Rochester was an integral part of the nicotine program at Philip Morris and could be justified in a number of ways. He wrote that the "combination of basic research on the pharmacology of the nicotine receptor combined with the capability to screen nicotine analogs for CNS activity complements our internal synthetic and behavioral efforts in the nicotine program." He felt the program was "justified in my view as a defensive response to the anti-smoking forces criticisms of nicotine and also as fundamental research into the nature of our product and how it affects our customers, the smokers." [1003289974-9975, Cipollone exhibit; dup 1000127793-7795, not produced]

In a March 21, 1980 memorandum, E.D. Sanders wrote that Abood's collaboration with Philip Morris was extremely beneficial and valuable. Abood's interaction with Philip Morris was crucial in establishing the prostration syndrome there. The Nicotine Program's goals were to determine whether the central and peripheral effects of nicotine could be "'separated'" and to design a nicotine analogue which would have nicotine-like activity in the CNS with little or no activity in the peripheral nervous system. The value of Abood's prostration syndrome test was the indication that nicotine did not appear to be mediated by a cholinergic receptor. Sanders believed that since nicotine's peripheral effects were well known to be cholinergic, the discovery of a non-cholinergic central receptor indicated the possibility of developing compounds meeting the above-stated goals. [1003289967-9968, Cipollone taken; dup 1000127786-7788, not produced]

Osdene, Seeman, and Dunn also commented on Abood's Nicotine Receptor Program at the University of Rochester. All felt that the project was of great benefit to Philip Morris. [1000127770-7771, not produced; dup 1003289965-9966, Cipollone exhibit; 1003289972-9973, Cipollone exhibit, all previous redactions highlighted; dup 1000127796-7798, not produced; 1000127789-7790, Cipollone privileged; dup 1003289969-9970, not produced]

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4. Nicotine Binding to Rat Brain Membranes

On February 19, 1980, Abood sent Osdene a progress report covering the first year's research results from the period March 1979 to March 1980. The first year's work focused on several different areas including 1) isolation of pituitary peptides with neuroeffector actions; 2) identification of neuroactive peptides; 3) characterization of the muscarinic cholinergic receptor from mammalian brain; and 4) characterization of the opiate receptor from mammalian brain. [1000127582, Cipollone produced; 1000127583-7587, Cipollone taken]

On June 20, 1980, Osdene received a manuscript from Abood entitled, "Stereospecific ^{3}H-Nicotine Binding to Intact and Solubized Rat Brain Membranes and Evidence for Its Noncholinergic Nature." It acknowledged funding support from Philip Morris and USPH. A comparison was made of the ability of a variety of cholinergic drugs and nicotine derivatives to compete with ^{3}H-nicotine binding and their relative potency to produce or inhibit the prostration syndrome caused by nicotine. It was found that a number of nicotinic cholinergic agonists did not produce the prostration syndrome when administered intraventricularly and that nicotinic cholinergic antagonists could not reverse or block the prostration syndrome produced by nicotine. It was concluded that the sites for nicotine binding were noncholinergic in nature. [1000127748-1749, Cipollone produced]

On February 5, 1981, Abood submitted a progress report for the second year of his research covering the period March 1980 to March 1981. [1000127625, Cipollone taken] On October 20, 1980, J. Seeman wrote a memorandum summarizing the second year of Abood's research. During the second year of Abood's efforts, Abood continued to develop the nicotine prostration syndrome and re-tested some of the analogs previously examined. Because of this work the Philip Morris Behavioral Group made significant advancements using in-house developed modifications and refinements of the prostration syndrome test. Abood also tested nicotine analogs prepared at Philip Morris using several different tests, such as receptor binding, binding to glass fiber filters, rat blood pressure procedures, and the prostration syndrome. [1003060873-0874, Cipollone produced, all redactions removed]

Future work planned by Philip Morris in collaboration with Abood included quantitating nicotinic activity at various receptors using rat brain receptors and torpedo fish membrane receptors. The goal was to correlate binding data with in vivo tests such as the prostration syndrome and discrimination study.

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More work was aimed at isolating nicotine receptors from a variety of preparations. The ultimate goal involved the isolation, identification and characterization of receptors. [1003060875-0876, Cipollone produced]

In 1981 and 1982, Abood sent several reports to Philip Morris concerning his research on locating nicotine receptors. [1000127552, not produced; 1000127553-7567, not produced] A 1981 report was entitled, "Relationship of Receptor Binding Affinity of ^{3}H-Nicotine to Rat Brain Membranes and Pharmacologic Efficacy to Molecular Configuration of Nicotine Analogues." Abood reported results of several analogues tested that not only had a high affinity to bind to brain membranes, but also demonstrated psychotropic activity as measured by the prostration syndrome. Other analogues had a high binding affinity, but no psychotropic activity. [1[illegible]7591-7605, Cipollone produced]

In 1982, Abood reported in several manuscripts that he had isolated a nicotine binding site. [1002973295-3300, not produced; 1[illegible]598-3320, not produced; 1000128325-8346, not produced]

In March 1983, Abood reported progress made in isolating a purified nicotine receptor. [1000127485, not produced; 10[illegible]86-7[illegible], not produced]

In March 1984, Abood reported the progress made during the period January 1983 to April 1984. He succeeded in improving methods to obtain better yields of a more active form of purified nicotine receptor. He conducted more research on binding sites with ^{3}H-nicotine, and he developed the methodology necessary to research the specific binding sites for ^{3}H-arginine vasopressin in rat brain. [1002973383, not produced; 1002973384-3392, not produced]

Abood requested continued support for his research for the period April 1984 to April 1985. Philip Morris sent the University of Rochester $40,250 on March 7, 1984, to cover the first six months of the sixth year of Abood's grant. [1000127311-7312, not produced; 1000127459-7460, not produced] No evidence of further funding was found. It was possible that Abood's funding from Philip Morris ceased some time after Philip Morris terminated its Nicotine Program.

5. Acetaldehyde Transport

The following discussion concerns the 1982 collaboration of DeNoble and Abood. The research focused on the transport of acetaldehyde to the brain.

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The first study addressed the following objectives:

(1) To determine whether acetaldehyde was able to cross the blood-brain barrier;

(2) To determine if there was a differential uptake of acetaldehyde by the brain through intravenous or intraarterial injections;

(3) To determine the ratio of acetaldehyde in blood compared to brain following intravenous or intraarterial injections; and

(4) To determine if there was a regional brain distribution of acetaldehyde.

The procedure involved injecting the rats with C^{14}-acetaldehyde into the bloodstream and taking blood samples from the heart and from three sections of the brain: the cortex, midbrain, and cerebellum. Brain tissue was also taken.

It was found that acetaldehyde readily crossed the blood-brain barrier and that the ratio of blood acetaldehyde to brain acetaldehyde was 10 to 1. The results indicated that the site of injection, whether intravenous or intraarterial, had no bearing on the uptake of acetaldehyde by the brain. Finally, it appeared that acetaldehyde was evenly distributed in the brain.

The second study conducted with Abood was performed to determine whether differential uptake of C^{14}-acetaldehyde occurred by nerve endings, myelin (sheath surrounding nerve cells), and mitochondria.

In this experiment, the rats were injected with C^{14}-acetaldehyde intravenously. Five minutes following the injection the rats were sacrificed and the brains analyzed for the localization of the acetaldehyde. The analysis revealed that most of the acetaldehyde was concentrated in the myelin and nerve endings, while a smaller amount was present in the mitochondria.

DeNoble felt that the results obtained thus far warranted additional research on acetaldehyde at both the behavioral and the CNS level. [820120, 1002973617-3619, Rothgeb produced: 1000012847B-8481 (dup), Rothgeb produced: 820421, 1003060442, 1003060443-0503 (p. 0460-0463), Rothgeb produced]

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B. Ohio State University (Berntson)

1. Overview

Gary G. Berntson was first funded by Philip Morris in 1972 when he was a post-doctoral student at Rockefeller University. In June 1974 Berntson moved to Ohio State University where he reestablished contact with Philip Morris. He received Philip Morris funding there from 1975 to 1981, and he served as a consultant to the Philip Morris Behavioral Research Program from 1977 through 1981.

Berntson's Philip Morris sponsored research followed a natural progression from his early work on nicotine and feline aggression to his later work on the effect of nicotine on learning and stress behaviors in humans. It did not appear that Philip Morris had any specific plan for Berntson's work in a particular commercial application or product; however, the director of the Behavioral Research Program, Dr. Dunn, viewed the work to be related to the general investigation concerning the benefits of smoking.

Berntson's funding ended after completion of his research in the 1980-81 academic year. There was no documentation why funding ceased. Philip Morris evidently found Berntson's consultancy to be valuable, and this arrangement continued throughout 1983. Again, no documentation was found why his consultancy lapsed: however, it should be noted that the lapse occurred around the same time that Philip Morris terminated DeNoble and the Nicotine Program.

2. Rockefeller University Research

As a post-doctoral student, Gary Berntson received Philip Morris funding beginning in 1972. His grant supported research on a central nicotinic receptor system antagonistic to the muscarinic receptor system, the latter being association with aggression and stalking behavior. [1003290213, Cipollone taken]

Berntson reported that in the cat, aggression and stalking behavior were caused by injections of a cholinergic agonist, and that this effect was muscarinic. Berntson attempted to determine whether there was a central nicotinic system that was antagonistic to the muscarinic system. [1003290202, Cipollone not produced]

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3. Ohio State University Research

a. Aggression and Pain Threshold in Cats

In 1974, Berntson submitted a proposal entitled, "The effect of nicotine on excitatory and inhibitory processes in learned and unlearned behaviors." [1003286238-6267, Cipollone taken) Berntson planned to investigate the effect of systemic and brain injections of nicotine, arecoline (a muscarinic agonist, or enhancer), and saline on feline aggression. His results showed that nicotine reduced both predatory-like biting attack on rats and hissing behavior as compared to saline and arecoline. [1003286277, Cipollone taken) These findings demonstrated discrete behavioral effects of nicotine at doses paralleling those in human smokers. [1003287972-7975, Cipollone taken)

In 1976, Berntson submitted a proposal to examine the pain-reducing properties of nicotine. He planned to study whether the systemic administration of nicotine would raise the pain threshold in cats by differentially lowering the emotional response to painful stimuli without suppressing sensation. [1003286198-6201, Cipollone taken) Berntson found that nicotine suppressed aggression but did not affect sensitivity or thresholds to shock. [1003286146-6163, Cipollone taken)

In 1977, Berntson submitted a proposal to study the effects of nicotine on rage behavior. He planned to study the effects of nicotine on pain-induced aggression in cats and to examine the receptor basis of nicotine-induced suppression of aggression. [1003286131-6142, Cipollone taken) No further reference or report was found regarding Berntson's research on nicotine and feline aggressive behaviors.

b. Stress and Memory in Humans

Also in 1977, Berntson extended his studies to the effects of nicotine on humans. He hypothesized that nicotine could reduce the effects of stress, and he proposed monitoring autonomic variables to determine the effects of nicotine on stress-related disturbances in performance tasks. [1003286144, Cipollone taken) In 1979, Berntson reported that high nicotine reduced galvanic skin reaction to stress as compared to the no-smoking and low nicotine conditions. [1003286377-6382, Cipollone taken)

In studies on learning begun in 1978, Berntson reported that in humans, nicotine specifically facilitated memory and clearly reduced reaction time regardless of memory set size, but low doses of nicotine had no consistent effect. [1003286377-6382, Cipollone taken]

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In his studies in 1979 using human subjects, Berntson demonstrated that nicotine aided recall of a series of memory set items. Response time was faster after the subject had smoked a high nicotine cigarette than under the no-smoking or low nicotine conditions. [1003286326-6330, Cipollone taken] Other studies indicated that nicotine could facilitate memory in initial tasks, but increased proactive inhibition of recall in subsequent similar tests. [1003286313-6320, Cipollone taken]

c. Pain Sensitivity in Rats

Also in October 1977, Berntson reported the results of studies on pain sensitivity in the rat. He reported that nicotine greatly reduced pain sensitivity in the rat as measured by the tail flick test and the hot-plate test. [1003286166; 1003286167, both Cipollone taken]

In 1978 Berntson proposed a study to examine nicotine induced analgesia in rats. He found that low doses of nicotine induced potent analgesia in rats when administered directly into specific locations in the brain. [1003286377-6382, Cipollone taken]

In 1979, Berntson proposed a study entitled "Analgesic and other behavioral effects of nicotine." [1003286498 not produced) Berntson proposed examining the central distribution of effective receptor loci for nicotine-induced analgesia in rats. [1003286365-6371, Cipollone taken] Berntson had proposed the idea that nicotine produced analgesic effects by releasing vasopressin; however, using rats unable to synthesis vasopressin, Berntson showed that nicotine was analgesic without vasopressin release. [1003286326-6330, Cipollone taken]

d. Learning in Rats

In 1980 Berntson submitted a proposal entitled, "Effects of nicotine on learning and memory." He proposed studies to determine whether nicotine's effects on animal learning were mediated via vasopressin release. [1003286355-6364, Cipollone taken] He concluded that both nicotine and vasopressin facilitated memory in rats. He found that nicotine facilitated memory only in animals with endogenous sources of vasopressin.

In 1981 Berntson submitted an untitled proposal to evaluate the effect of nicotine on stimulus sensitivity, response habituation and associative learning using the conditioned expectancy paradigm, which involved the repeated presentation of two paired stimuli. This proposal was not funded. [1003286341-6350, Cipollone taken]

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e. Consultancy

Berntson became a consultant for Philip Morris in June 1977, and continued in this capacity through 1983. There was no documentation why Berntson's 1981 proposal was not funded; however, as late as January 24, 1983, Charles stated in a letter to Berntson his view that Berntson could provide valuable consulting input to Philip Morris programs. [1003156858 not produced]

C. Medical College of Virginia (Egle)

1. Overview

The Egle research began in 1981 and was terminated by Philip Morris in June 1984. Egle was hired to screen nicotine analogs for their effect on rat blood pressure, and then a decision would be made by Philip Morris whether or not additional work was required. Philip Morris documents indicated that Egle's research was intertwined with other nicotine analog research Philip Morris was conducting. Egle was not aware of the work conducted by DeNoble, Abood or INBIFO. He may or may not have understood that the compounds he was testing were nicotine analogs. Egle referred to the compounds in his reports by number codes.

The primary purpose of the screening work was to determine the effect and mode of action of nicotine and nicotine analogs on the cardiovascular system. Egle's research progressed from simple screening of the effect of nicotine analogs on rat blood pressure to more detailed research to determine how analogs caused a decrease in blood pressure. Philip Morris' objective was to find compounds with desirable central nervous system effects but with little or no peripheral nervous system effects. [1002973191-3194; 1002973189-3190; 1002973196-3197]

The documents did not explicitly outline the reasons why Egle's research was terminated. On June 5, 1984, Osdene sent a letter to Egle informing him that Philip Morris was terminating the project. [1002973277; 1003157366] The termination of the Egle project occurred at approximately the same time as the termination of the Nicotine Program.

Documents concerning Egle's research were not produced in Cipollone because the topic of peripheral nervous system effects of nicotine was considered nonresponsive.

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2. Projects

a. Dose Response Curves

In 1981, Egle proposed to determine the effect of intravenously administered compounds on rat blood pressure. Of thirty-six nicotine analogs tested, seventeen caused an increase in blood pressure, fifteen caused a decrease in blood pressure and four caused either an increase or decrease depending on the dose administered. [1002973250-3276] Compound CR-1974 was the most potent compound in decreasing blood pressure. [1000128485-8498; 1002973119-3131; 1003060029-0042] Compound CR-1766A caused a decrease in blood pressure up to a dose of 10 mg/kg but at higher doses, caused an increase in blood pressure. Nicotine produced an increase in blood pressure in a dose-related manner. Phase two of this research consisted of comparing results of analogs previously tested in albino rats with results obtained from tests with hooded rats. However, no research reports on this study were found.

b. Autonomic Blocking Study

The third phase was designed to determine the mode of action of two nicotine analogs, CR-1766A and CR-1974 because in the screening work, both had caused a decrease in rat blood pressure. Autonomic receptor blocking agents and surgical procedures were used to elucidate the mode of action of these compounds. [1000128234-8262; 1002973221-3249; 1003060000-0028; 1003157591-7618; 1003176942-6969; 1003582109-2137; 1002973250-3276] The goal of the research was to determine the autonomic neural receptor type affected by nicotine and the two test compounds. The autonomic blocking study demonstrated that nicotine increased blood pressure by causing the release of epinephrine from the adrenal glands. Following the administration of atropine (a muscarinic blocker), nicotine caused an increased heart rate. The study revealed that compound CR-1766A had a biphasic effect because it affected several different receptor sites. At doses greater than 10 mg/kg, CR-1766A caused an increase in blood pressure by its effect on alpha receptors. At lower doses, CR-1766A caused a decrease in blood pressure by activation of muscarinic and beta-2 receptors. CR-1974 exerted a negative effect on blood pressure and heart rate. This was determined to be the result of stimulation of muscarinic receptors. CR-1974 also affected beta-2 receptors and appeared to have weak ganglionic properties.

c. Adrenalectomy and/or Vagotomy

The fourth phase of Egle's research determined how much of the effects of nicotine, CR-1766A and CR-1974 were exerted as a result of secretion of epinephrine and how much were exerted by stimulation of the vagus nerve. [1002973250-3276] The experiment

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used alpha and beta autonomic blocking drugs and adrenalectomy and vagotomy. The increase in blood pressure normally caused by nicotine was greatly reduced by adrenalectomy. Following vagotomy, nicotine increased heart rate rather than decreased heart rate. After adrenalectomy, CR-1766A at all doses caused a decrease in blood pressure but after vagotomy, it produced an increase in blood pressure. After vagotomy, CR-1974 caused an increase in blood pressure instead of a decrease in blood pressure.

d. Acute Toxicity Study

An acute toxicity study revealed an intravenous LD50 of 1.5 mg/kg for nicotine and 95.1 mg/kg for CR-2289. [1002973133-3136] The toxicity symptoms were initial respiratory stimulation followed by increased labored breathing and respiratory arrest.

D. Foundation for Behavioral Research (Hutchinson)

1. Overview

Ronald Hutchinson's research association with Philip Morris began in December 1969. [1003291007-1008, Cipollone taken; 1000048553-8556, not produced] At that time, Philip Morris funded two studies on the relationship between (1) aggression and smoking and humans, and (2) aggression and nicotine in monkeys. In February 1971, Philip Morris funded two more studies which essentially expanded on the theme of the previous aggression and nicotine in monkeys study. [1003291030-1031, Cipollone taken; 1003291033-1045, Cipollone Exhibit]

Hutchinson's research appeared to be part of Philip Morris' general research plan to study the benefits of smoking. Hutchinson presented the results of his work at the St. Martin's conference, and his work was subsequently published in 1973 as Chapter 11, "Effects of Nicotine on Avoidance, Conditioned Suppression and Aggression Response Measures in Animals and Man," in Dunn's book, Smoking Behavior: Motives and Incentives. [1003292259-2296, Cipollone Exhibit; 1001840650-0675, not produced] Hutchinson stated that, "Our interest in aggression and emotional reaction is fundamentally directed to understanding human behavior." It was interesting to note that Hutchinson himself had reservations about making his research results public. In the cover letter of one of his proposals, Hutchinson wrote to Dunn that the "basic outline is now at hand for understanding the psychopharmacologic effects of cigarette smoking," and that this information "constitutes an extremely powerful position for Philip Morris relative to its competitors." This indicated Hutchinson's recognition that research results from studies of this type might have commercial applications for Philip Morris. He believed that

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Philip Morris could realize large profits from some of the research presented at the St. Martin's conference and questioned Philip Morris for presenting results to its competitors.

In September 1972, Hutchinson submitted a proposal to Philip Morris to study the "Blood pressure reductant effects of nicotine;" however, this study was ultimately funded through CTR as Grant No. 883 in 1973. Hutchinson received another CTR grant, No. 1107 in January 1977 to study the "Effects of acute and chronic nicotine administration on aggression and blood pressure reactions in rats and humans." This study was renewed in January 1978. [1003291059, not produced; 10000255182, not produced; 10000255259-5260, not produced] [1000036624-6630, Cipollone taken] [1005045263-5279, Cipollone taken]

2. Projects

a. Aggression and Smoking in Humans

The first project Hutchinson conducted, between 1969-1970, was entitled, "Effects of Cigarette Smoking Interruption and Resumption on Aggressive Levels in Humans." Using jaw clenching as a measure of aggression, Hutchinson measured experimentally-induced aggression levels in subjects, smoking at will before and during the experimental sessions, and in subjects smoke-deprived before and during the sessions. [1003291126-1142, not produced] Results showed that heart rate and blood pressure decreased upon cessation of smoking, while jaw clenching increased, then decreased. Triceps muscle contractions also increased somewhat after cessation of smoking. [1000029300-9345, Cipollone produced]

b. Aggression and Nicotine in Monkeys

The second research study undertaken by Hutchinson in 1969-1970 was entitled, "Effects of Nicotine Upon Shock-Induced Aggression in Squirrel Monkeys." [1003291126-1142, not produced] This study explored the effects of various doses of nicotine on artificially-induced, hyper-aggressive biting attacks in squirrel monkeys. Hutchinson found that on control days, three of the four monkeys tested had "before shock" lever presses (orienting reaction), while one of the four monkeys had no "before shock" reaction. Nicotine administration produced a dose-dependent increase in pre-shock lever pressing (orienting) in those three animals, while simultaneously producing a dose-dependent decrease in post-shock biting in all animals. [1000029300-9345, Cipollone produced]

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c. Chronic Effects of Nicotine on Attack Reaction in Monkeys

Hutchinson proposed two new research proposals for the period 1971-1972. The first experiment was entitled, "Effects of Chronic Administration and Withdrawal of Nicotine Upon Shock-Produced Attack and Orienting Reactions in the Squirrel Monkey." This study sought to discover whether nicotine administration produced alterations in attack biting and orienting (lever pressing) reactions as compared to chlorpromazine and amphetamine administration, and to determine the effect of termination of these compounds on these reactions. [1003291033-1045, Cipollone Exhibit) The results demonstrated that chlorpromazine, chlordiazepoxide, and nicotine shifted response tendencies toward more pre-shock motor (lever pressing) reactions, while amphetamine increased both the pre-shock motor (lever pressing) and the post-shock biting attack behavior at low doses. Morphine administration decreased both behaviors. Hutchinson also investigated the effect of abrupt termination of chronic nicotine intake. When nicotine was withdrawn, subjects showed temporary large increases in post-shock biting attack behavior. After the third post-drug session, attacks were back to pre-nicotine biting levels, but not as low as the levels during nicotine intake.

d. Conditioned Suppression in Rats and Monkeys

The second study conducted in the 1971-1972 period was entitled, "Effect of Subcutaneous Nicotine Upon Conditioned Suppression in Rats and Squirrel Monkeys." This study tested the stress reducing properties of nicotine using the conditioned suppression method. Subjects were conditioned to lever press for food rewards on a variable-interval reinforcement schedule. Subsequent to establishing a consistent pattern of responses, a 30 second tone followed by a shock was delivered on an unpredictable seven minute variable-interval, response-independent schedule. When responding had become stable during saline control injections, the subjects were injected with different doses of nicotine. The effect on suppression of responding (lever pressing) during the tone stimulus relative to responding during the absence of tone was assessed.

The results showed that for monkeys, responding (lever pressing) previously suppressed during the tone stimulus was increased at lower nicotine doses, but reduced a higher doses. In rats, administration of nicotine reduced the suppression of responding (lever pressing) during the tone stimulus at both low and intermediate doses [1003291033-1045, Cipollone Exhibit; 1003292259-2296, Cipollone Exhibit; 1001840650-0675, not produced]

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Hutchinson concluded from his research that for both humans and monkeys, nicotine produced a differential reduction in behavior patterns associated with aggression and hostility, and this effect was similar to that produced by tranquilizers. The same dose of nicotine that decreased aggression would also elevate orienting and anticipatory reactions, an effect characteristic of tranquilizers. Nicotine also reduced the suppression of behavior caused by contact with fear or anxiety-producing stimuli. Hutchinson concluded that termination of chronic nicotine ingestion caused temporary increases in aggression, hostility and irritability in both monkeys and man. The finding "seemed to support strongly the proposition that the intake of nicotine in a stressful or noxious environment will constitute a reinforcing event and the termination of such a practice will constitute a punishing or negatively reinforcing event."

F. Rockefeller University (Waldbillig)

1. Overview

Robert Waldbillig was funded by Philip Morris from 1974 through 1976 when he was a post-doctoral student at Rockefeller University. Waldbillig conducted research on the effect of nicotine on shock-induced aggression and natural predatory behaviors in rats.

In October 1977, Dunn criticized Waldbillig for not having provided written reports on his Philip Morris-supported research. Although it was never clearly stated, there was the implication that Waldbillig's financial support was withdrawn for this reason.

2. Projects

a. Nicotine-Inhibited Aggression

In 1974, Waldbillig proposed to test the hypothesis that nicotine inhibited aggression by mimicking the action of brain acetylcholine. He planned to elicit intraspecies aggression in rats using painful tail shock before and after activation of brain chemoreceptors by an injection of nicotine. Waldbillig's goal was to establish the location of nicotine's site of action. If nicotine was shown to inhibit aggression, and its site of action specified, then Waldbillig planned to inject the active site with curare, a drug known to block the activation of nicotine receptors. He hypothesized that the loss of the nicotine inhibitory influence would result in increased aggressiveness. (1003290195-0197, Sipollone taken)

Waldbillig reported that the threshold for pain-induced aggression was raised by nicotine, and that he was attempting to determine nicotine's site of action by the systemic administration

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of various antagonists in conjunction with nicotine. [1000362772-2795, Cipollone produced]

b. Predatory Attack

Waldbillig proposed in 1974 to study the effect of nicotine on the spontaneous predation of rats on mice. The method was simply to record attack latency before and after injection of nicotine in control solutions.

Waldbillig reported that his results revealed a clear inhibition of predatory attack in natural attackers that was not due to generalized effects such as debilitation or sedation. Nicotine-induced blockade of attack was observed during many months of testing. Such stability of findings argued strongly against an interpretation of inhibition in terms of stimulus generalization decrement. [1000285967-5970, Cipollone taken] Further study showed that the suppression of predatory attack was due to nicotine's action in the brain and not in the periphery.

c. Depletion of Serotonin on Aggression

In 1977, Waldbillig proposed research on the depletion of the neurotransmitter serotonin on aggression. Preliminary findings had indicated that the depletion of serotonin increased predatory attack. Serotonin-depleted animals were also hyperactive and hyperreactive. Waldbillig proposed studying whether intraperitoneal injections of nicotine could reduce this hyperresponsiveness to normal levels.

In 1980, Waldbillig published an article on his Philip Morris sponsored research entitled, "Suppressive Effects of Intraperitoneal and Intraventricular Injections of Nicotine on Muricide and Shock-Induced Attack on Conspecifics." He reported that intraperitoneal injections of nicotine suppressed mouse-killing by rats in a dose dependent manner. Hexamethonium, a peripheral nicotinic receptor blocker, did not inhibit the suppression of aggression by nicotine. Mecamylamine, a central nicotinic receptor blocking agent, however, did reduce the inhibition of attack produced by nicotine. Waldbillig stated that although a CNS effect seemed likely, the exact mechanism of nicotine suppressed attack behavior could not be determined.

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Mr. C. H. Goldsmith March 7, 1968

H. Wakeham

Hilton Head Meeting of the Cigaret Company Research Directors February 14-16, 1968, or Some Thoughts on Cooperative Research in the Tobacco Industry

When the smoking and health question became critical in the 1950's, the tobacco industry took two steps to meet the situation. First, it adopted the "vigorous denial" approach: "the statistical evidence is biased," "nothing is proven," "animal experiments don't tell us what happens in humans." At the same time, the industry set up the Tobacco Industry Research Committee to sponsor medical research on cancer. The industry hoped in this way to demonstrate its concern for the cancer problem and to discover by research, if possible, the truth about smoking and health. No efforts were spared to make TIRC a completely objective, independent agency whose results would be believed by the public and the scientific community to be free of bias.

These actions were no doubt effective, at least at first, in assuring the public (as well as the industry people themselves) that the industry was coping with the problems but they failed to deal effectively with the basic scientific aspects of the problem. At the same time the constant activity of the anti-cigaret people in the form of newspaper publicity, magazine articles, governmental actions, and lately the Surgeon General's Committee Report and the "warning label" have built up out of all sensible proportion the health risk of cigaret smoking. Certainly it would be hard to find a person in the United States today who would say that cigaret smoking is healthful. To the contrary, most everyone believes that smoking involves more or less serious risk to health, albeit a risk most smokers are willing to take for the pleasures of smoking.

Meanwhile the industry, continuing its policy of "vigorous denial," finds itself in the role of the "bad boy" in opposition to the forces ostensibly dedicated to the welfare of the people: Federal agencies like F.T.C., N.I.H., P.H.S., and U.S.D.A.; cancer research institutes like Sloan-Kettering and Roswell Park; public supported health organizations like American Cancer Society, American Heart Association, etc. This image encourages the anti-cigaret zealots and publicity seekers (politicians, etc.) to use the cigaret industry as a convenient whipping boy, which only makes the image, if anything, worse in the mind of the public. To this the industry has essentially replied merely by repeating the vigorous denial: "experimental proof is still lacking," "the statistics are poorly obtained and in any event not to be trusted," "no one knows the cause of cancer so how can it be cigarets

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"the claims against cigaret smoking are grossly exaggerated," and anyway why pick on us when there are so many other more frequent causes of death than lung cancer? Of this the public can only say like Hamlet's Queen Mother, "The lady doth protest too much."

The loud cries of the anti-cigaret zealots have now convinced so many of the uninformed masses that cigarets are harmful that the voice of the moderates is stilled throughout the land. The situation has gotten to the point that the moderates, most physicians, and other scientific professionals will not speak out on the subject even in behalf of scientific truth because they are fearful of public criticism and professional ostracism. We have it on good authority, for example, that many scientists and physicians believe that Dr. Carl C. Seltzer committed professional suicide in his courageous attack in J.A.M.A. on the anti-cigaret "establishment" and its allegations that smoking causes coronary heart disease. Dr. Joseph Berkson and Professor K. Alexander Brownlee and others who formerly spoke up in behalf of scientific objectivity have been strangely silent during the past few years.

Fortunately, despite this loss of credibility on the part of industry, smoking goes on essentially unabated, although the increasing popularity of filters and acceptability of low delivery brands indicate people are worrying about the problem. The populace and stock market reaction to Strickman clearly demonstrates public concern, and one may expect per capita participation in smoking to decrease as the current anti-smoking propaganda campaign begins to take effect.

What steps has the industry taken to combat this deterioration of its image over the past fifteen years? It established the Tobacco Industry Research Committee (now The Council for Tobacco Research - U.S.A.) which, although it may initially have had a public relations benefit, has, in this writer's opinion, given little positive support to the "vigorous denial" approach nor has it given respectability to the industry's posture of objectivity. It has produced few if any objective and newsworthy findings to controvert the allegations of the anti-cigaret zealots. The same negative conclusion might be made of the A.M.A. Tobacco and Health research program, although it is too early to evaluate its results in any depth.

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Somewhere between the "vigorous denial" and the open admission of allegations must lie an area in which the industry can find an image of credibility and objectivity in the minds of knowing people. Somewhere between no research and a massive effort to find the cause of cancer there must be an area of scientific endeavor which will give the industry a solid basis on which to stand. Somehow or other it must be possible to establish a group of industry supported scientists, respected by their peers even in the anti-cigaret scientific community, who can raise a voice in favor of scientific truth that will be heard.

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The writer believes that the basis for this kind of a scientific endeavor lies in a cigaret industry cooperative research organization. Such an organization might be called the Cigaret Research Institute. Its membership would be open to all cigaret manufacturers. Its purpose and objectives would be to assemble, generate, and evaluate scientific information about tobacco, cigarets, cigaret components, smoking behavior, etc. of common interest to the members and to make such information available to the member companies and for such further use as the members may deem appropriate. In time it might be expected that the Cigaret Research Institute would carry out a broad enough and sound enough program to establish the scientific fact needed to put the smoking and health problem into proper perspective.

There follows a list of industry-wide research problems to which the Cigaret Industry Institute could address itself immediately:

1. What is the smoking behavior of the cigaret consuming public, and how is this related to the actual smoke exposure of the smoking public (as opposed to the potential exposure based on F.T.C. tar test method)?
2. Development of information on the relation of smoke composition to the conditions and/or method of smoke generation leading to the improved definition of smoking conditions and/or machines which simulate human smoking.
3. Determination of the precursors of compounds in smoke, particularly of those which might be deemed hazardous to health.
4. Development of improved and accepted standard analytical procedures of common interest.
5. Compilation of data on tobacco composition as related to other characteristics and conditions of growth beyond that now being done in the cooperative crop development program in the experimental stations.
6. Determination of information relative to agricultural residues in tobacco and smoke.

These studies will provide a background for two other broad studies which the tobacco industry may some day wish to initiate:

A. A review of epidemiological evidence relating human ailments to environmental and behavioral factors with the aim of revealing other areas which can be investigated to find to what

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extent human ailments are really due to smoking and what are due to other causes. An outgrowth of this study might be an attempt to define in some manner those elements of the population who, like asbestos industry workers, are more likely to encounter serious risk by smoking and who, therefore, should be discouraged from indulging the habit. Nothing could give greater credibility to the good will of the cigaret industry than this kind of a move.

8. A complete quantification of physiologic and morphologic effects of whole smoke, smoke fractions, and/or smoke components on various animal systems.

There are probably other areas in which a cooperative program would be beneficial, but the above listing will suffice for the moment. Let us review some advantages of the proposed Cigaret Research Institute.

1. Our major technical problems are common to all cigaret companies and are of such a magnitude and complexity that the large effort required is beyond the research resources of any single company. Under these circumstances, a concerted action is better and more effective than individual action. It overcomes the disadvantage of duplication, and increases greatly the over-all quantity of information available to all companies. Furthermore, the strength in numbers working on common objectives is more effective in dealing with our scientific critics.

2. An industry research institute would provide a basis for technical cooperation with other agencies such as government, research foundations, public supported associations, etc., which would find it awkward to deal with one single company as a representative of the industry. Relations of this type in the legal, political, and public relations field are being handled by The Tobacco Institute, etc., but no such mechanism is available for technical liaison and communication.

3. The Research Institute could have an apparatus which would anticipate and prepare information for countering anti-cigaret propaganda blasts of a scientific nature.

4. The Research Institute would provide a mechanism for carrying out contract research and for investigating areas of interest to the entire industry which are brought in by outside agencies and inventors. Of course, it would have to be recognized that the Institute management would have to guard against needless diversion of the effort due to outside idea investigation and attempts by others

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to use the Institute for propaganda or public relations purposes. The Institute should limit itself to basic technologies applicable to broad industry programs.

In its organization the Institute would require a capable director, familiar with the problems of the industry and yet of sufficient scientific stature to command the respect of the non-tobacco scientific profession. It would require an efficient central research facility. Some of the work of the Institute could be done by parceling out cooperative activities to the various company research laboratories in those instances where the company laboratories are uniquely qualified, both in terms of manpower and equipment, to carry on certain types of work. Other areas of investigation could be contracted out to suitable research institutes, universities, and similar organizations. It is not visualized that the Institute would make grants for academic type research, and in this respect it should be emphasized that the Institute program should be considered as complementary to rather than equal to or replacing existing programs in other tobacco industry supported agencies.

A most difficult aspect of the Institute would be the control of information generated by the Institute. One approach might be that all of the information obtained by it should be restricted to the research departments of the member companies, on whom would then be placed the responsibility for the proper use of the information. Since the company research groups are generally under the company managements, they would be expected to be sufficiently sensitive to the propriety of releasing information which would undermine and possibly destroy the benefits of the Cigaret Research Institute to the industry as a whole.

Finally, let it be said that this proposal is in essence the more effective organization of activities already underway on an ad hoc basis. The research directors of the several cigaret companies now meet to discuss and solve common problems. Examples are the formation of the Tobacco Institute Testing Laboratory, the investigation of Chamosol, the evaluation of smoking machine prototypes for The Council of Tobacco Research, the study of smoking patterns for selection of a standard butt length, etc.

All of these activities have been cooperatively carried out, utilizing both internal and external resources, and under the supervision of one or another of the company research directors. To a greater or lesser extent these activities have interfered with the company directed goals of the respective research departments. It is time an effective industry-wide technical organization be considered to handle these and other important technical matters. To be sure there would be problems in this as in any other organization, but none which could not be solved by capable leadership.

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Mr. Goldsmith - 6 - March 7, 1968

The cigaret industry cannot help but benefit in the long run from the execution and publication of properly designed and performed researches which lead to the revelation of truth, whatever it may be. Our present situation stems from lack of knowledge rather than from an overabundance. If we had available better or more certain knowledge of any existing or potential health hazard from cigaret smoking, we would have a greater likelihood of modifying cigarets in a manner to reduce the hazard and to preserve the benefits of smoking and our business. If, on the other hand, good researches reveal new truths, negating previous conclusions regarding the hazards of cigaret smoking, eventually these truths will silence our critics and again benefit the industry. The one way in which we can in the long run do ourselves the greatest harm is to fail to learn all we can about our products and our business, to fail to do the researches necessary to meet the technical challenge the industry now faces.

H W Wakeham

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April 6, 1994

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PHILIP MORRIS RESEARCH ON NICOTINE PHARMACOLOGY AND HUMAN SMOKING BEHAVIOR

I. Introduction

Philip Morris has been interested since the 1960s in the benefits of smoking and why people smoke. Consequently, Philip Morris conducted and sponsored research related to these areas. Philip Morris apparently wanted to support its view that smoking provided certain benefits to smokers. Philip Morris also conducted research to attempt to determine whether smoke deliveries affected how people smoked cigarettes.

Beginning in about 1974, the research program's stated goals were to learn more about why people smoke; to learn more about how people smoke; and to identify what people want to smoke. Philip Morris has continued to investigate these areas. As recently as 1988, Philip Morris sponsored research investigating the benefits of smoking and the historical uses of tobacco.

II. Philip Morris Research: Human Smoking Behavior

A. Why conducted

Dr. Wakeham in a presentation to the Philip Morris Board of Directors on November 26, 1969, indicated that there were two aims for the smoker psychology program. These were "to learn more about the psychology of smoking, hopefully to discover ways to exploit the benefits of smoking to the advantage and profitability of our major company business." (Dunn Deposition Exhibit 7 (bates 3741-3441 P/T) in Cipollone; p. 82, lines 6-11, 16-21) [Similar language found at 1000046538-6546 P/T]

Dr. Dunn indicated that his charter was to investigate why people smoked cigarettes. One of the hypotheses that they considered was that nicotine might be a reinforcing agent. He also indicated that it was his job "to provide information, knowledge about the consumer of the product which Philip Morris made, such that Philip Morris can make a cigarette that would be more acceptable to that smoker and cause him to buy Philip Morris cigarettes over a competitor's cigarettes." (pp. 41, 75, 76-79; Dunn Deposition in Cipollone)

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B. What Was Done, When Was It Done/Results

1. Compensation Studies, 1966 - 1983

Puff volume, puff duration, puff interval, length of rod smoked were measured in response to varying tar and/or nicotine levels. It was generally concluded that smokers try to maintain constant intake of tar and nicotine levels.

According to Dr. Dunn, this was a hypothesis that Philip Morris investigated. He would not agree that Philip Morris' research concluded that people compensate. In fact, other Philip Morris studies were conducted in which they found that these results on maintenance for constant intake were not confirmed. (See pp. 23-26; Dunn Deposition in Cipollone.)

2. Electrophysiological Studies, 1969 - 1983; Currently EEG Studies Are Done At INBIFO (date?)

Measured changes in brain activity in response to cigarette smoking in an effort to determine how and where nicotine affects CNS.

Data indicated that cigarette smoking has specific rather than generalized effects on the CNS. The effects appeared to depend upon the degree of deprivation, nicotine delivery, as well as, the location of electrode placement.

Present EEG studies conducted by INBIFO focus on assessing the sensoral impact aspect of new products.

3. Motivation/Quitting, 1964 - 1991

Goals were to measure psychological and physiological events preceeding, during, and after smoking, particularly concerned with motivations sustaining the smoking habit. Concerned with marketing the ultimate cigarette.

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The conclusions were that most smokers can be considered nicotine seekers, however, psychosocial and cultural factors are involved.

4. Benefits/Smoker Psychology, 1962 -1980

Studied relationships between anxiety, stress, attention, performance, aggression, mood change, etc. and smoking behavior. Concerned with why people smoke to shed light on smoking rates, styles and brand choices.

Conclusions were mixed but generally indicate that smoker smokes more when under stress.

5. Human Smoker Simulation Studies, 1956 - 1982

Goal of this research was to determine whether actual smoker intake of tar paralleled FTC values. Results indicated that standard smoke test conditions are not indicitive of how people smoke. This research generated no publications.

C. Connection With Addiction

Dr. Dunn authored a document which stated that the cigarette should not be conceived as a product but rather as a package and that the real product was nicotine. According to Dr. Dunn, "[t]his was a hypothetical presentation that I was proposing as a way of thinking that might generate good research." (p. 72, lines 4-9; Dunn Deposition in Cipollone)

When asked why people smoke, Dr. Dunn stated: "I could list a half dozen motives that would be involved, and I have no real feel for which is relatively more important or less important of those motives. (p. 125, lines 11-19; Dunn Deposition in Cipollone) Dr. Dunn also acknowledged that tar and/or nicotine may be deleterious to human beings. (pp. 102-103; Dunn Deposition in Cipollone)

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D. Philip Morris Sponsored Research [Conducted by outside investigators]

From 1972 to 1981, Philip Morris supported research by Dr. Gary Berntson, first at Rockefeller University and then at Ohio State University. Dr. Berntson studied the effects of nicotine on aggression in cats and later extended his work to the effect of smoking on learning and stress behaviors in humans.

From 1969 to 1972, Philip Morris supported research by Dr. Ronald Hutchinson at the Foundation for Behavioral Research, concerning aggression and smoking in humans and in monkeys. A part of this research was subsequently funded by CTR grants.

In 1972, Philip Morris provided funds for research by Alan E. Mayer, Lucy N. Friedman and Paul F. Lazarsfeld at Columbia University. The purpose of the study was to determine responses of a sampling of Americans to the continuing anti-smoking campaign.

From 1974 through 1976, Philip Morris funded research by Dr. Robert Waldbillig at Rockefeller University; this research concerned the effect of nicotine on shock-induced aggression and predatory behavior in rats.

From 1973 through 1975, Philip Morris contributed funding for support of research by Dr. Stanley Schachter and several of his graduate students at Columbia University. His research concerned the behavior of human smokers and the factors that affected it, including nicotine.

During 1976, Philip Morris provided funds for research by Dr. Ryan Kozlowski at Wesleyan University. This research continued some of his studies done under the direction of Dr. Stanley Schachter and also funded in part by Philip Morris. The studies concerned the effects of various factors on cigarette smoking and human smokers.

E. Publications [See Appendix A for complete list] [HELPFUL]

The research conducted or sponsored by Philip Morris concerning smoking behavior and related topics was not secret. At least seven publications resulted from research conducted by Philip Morris scientists. In

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addition, at least eighteen published papers or abstracts resulted from research funded, at least in part, by Philip Morris. Philip Morris's support was acknowledged in many of these publications.

Further, Dr. William L. Dunn, a psychologist who worked for Philip Morris for many years, organized and chaired a conference on smoking behavior in 1971. Scientists interested in this field from the United States and abroad attended this conference and presented some results of their own research, whether supported by Philip Morris or not. The proceedings of this conference were published as a book in 1973, and scientists active in the field of smoking behavior have often cited papers in this book. Dr. Jerome Jaffe, plaintiff's "addiction" witness in the Cipollone case, testified at trial that he was well aware of the conference proceedings, edited by Dr. Dunn.

y. Discontinued Research

Dr. Dunn testified in his deposition in Cipollone that parts of his program were discontinued in 1982 or 1983. He did not specifically identify which parts. He indicated that all the people who were working with him were reassigned to other functions. He indicated that he had no idea why they had made reassignments: "I don't know. I'm not privy to the decisions, the causes for the decisions that come back on the program." (pp. 125-126; Dunn Deposition in Cipollone)

XII. Philip Morris Research: Pharmacology

A. Why Conducted?

In 1957, the goal of the Comparative Psychology Program was to conduct research on the premise that if human smoking behavior was a function of the pharmacological effects of smoke component(s) of smoke, then the mechanism supporting the behavior could be studied through the observation of the effects of smoke on the behavior of animals. This program was headed by Victor J. DeNoble.

Specifically, the goals of DeNoble's program were

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1. to develop a better understanding of the reinforcing actions of nicotine and nicotine analogs.

2. to gain insight into the neurobehavioral actions of nicotine.

3. to develop and use animal behavioral techniques to screen nicotine analogues for their nicotine eliciting properties. [1003060646-0655 P]

4. to develop empirical evidence that would differentiate nicotine from the classical abuse substances. [1000085385-5392 P]

In addition, he was to expand an existing program in nicotine research, nicotine analog research and to continue to expand that program into smoke components and other effects that nicotine may have on the central nervous system." (p. 15, lines 23-25; p. 16, lines 1-2; DeNoble Deposition in Rothgab)

The primary objective being: to identify unique pharmacological actions of nicotine as manifested in lower-ordered mammalian behavior. (p. 23; DeNoble Deposition in Rothgab)

1. Nicotine Analog Program - CAVEAT [This program could play into advocates' position re: recognition by Philip Morris of importance of nicotine and its drug-like effects.]

The major objective of the animal behavior studies was to develop behavioral tests which were sensitive to the effects of nicotine and which could be used to screen nicotine analogs for central nervous system activities. A major goal was to develop nicotine analogs which would have "desirable" effects on the central nervous system without the "undesirable" effects of nicotine on the peripheral nervous system. Studies conducted by DeNoble included the use of specific experimental protocols to determine whether the animals would differentiate between nicotine and the nicotine analogs.

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According to DeNoble, the original purpose of the program was to evaluate nicotine analogues. "These are chemical modifications of the nicotine structure. The goal of the program was to identify a nicotine analogue that possessed the central nervous system activities, that is would go to the brain and have an effect on the brain, and yet not have an effect on the peripheral system, the cardiovascular system, specifically. (p. 24, lines 4-22; DeNoble Deposition in Rothgab) [See also: 1003289027-9035 F]

2. More "Desirable" Product - CAVEAT [Note: These reasons could play into advocates' position that Philip Morris recognized the importance of nicotine CNS effects and used these to get people to smoke.]

James Charles, in a March 18, 1980 memorandum, stated that nicotine was a "powerful pharmacological agent" and had been cited as "'a reason for smoking.'" He said that for these reasons, the nicotine analog program could lead to "many opportunities for acquiring proprietary compounds which can serve as a firm foundation for new and innovative products in the future." [1003289974-9975]

"The potential was possibly making a safer, more rewarding cigarette. (p. 69, lines 2-25; p. 70, lines 1-2; DeNoble Deposition in Rothgab)

He discussed the potential gains, that is, to understand cigarette smoking from a pharmacological point of view, the advantage of once we understood that to enhance the process, to make a better product. (p. 80, lines 2-25; p. 81, lines 1-16, DeNoble Deposition in Rothgab)

3. What Was done, When It Was Done/Results

According to Dr. DeNoble, they established the model in which animals would intravenously self-administer nicotine. They expanded upon nicotine self-administration by looking at agonists and antagonists, compounds to block the effect. They evaluated the effects of chronic administration of acetaldehyde and nicotine to determine whether or not there was a

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physiological dependence. They evaluated super sensitivity; changes in brain receptors following chronic administration of nicotine. They investigated the effects of different brain sites on the nicotine-induced prostration syndrome to get an idea of how nicotine was acting and where it was acting in the brain. They looked at carbon 14 labeled acetaldehyde to determine where it went in the brain of animals. (See pp. 28-29, 36-37; DeNoble Deposition in Rothgab)

1. CNS Studies, 1971-1983

Sites of action and magnitude of nicotine, acetaldehyde, and nicotine analogue effects were evaluated in order to understand how and where nicotine's beneficial effects occur in the CNS.

2. Analogues, 1969-1983

Goals were to develop nicotine analogues with the desireable CNS effects of nicotine without the undesireable PNS effects. No conclusive results are present in the research documents.

3. Reinforcement/Self-administration Studies

a. Nicotine, 1978

The goal was to show that nicotine functions as a positive reinforcer. Nicotine was shown to be a weak reinforcing agent.

Since nicotine's effects were successfully blocked with a centrally acting nicotine antagonist (and not with a peripherally acting antagonist), it was determined that nicotine's reinforcing effects are centrally mediated.

DeNoble's research found that some animals preferred food to reinforcement with nicotine. (p. 131; DeNoble Deposition in Rothgab)

Note that: Dunn indicated that there were other findings not supportive of the hypothesis that nicotine was a positive reinforcer. (p. 93; Dunn Deposition in Cipollone)

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b. Acetaldehyde, 1980

The goal was to better understand possible reinforcing effects of acetaldehyde. Acetaldehyde was shown to be a positive reinforcer.

They were interested in acetaldehyde because of its large concentration within cigarette smoke. (p. 34; DeNoble Deposition in Rothgab)

DeNoble reported the following effect of acetaldehyde in the animal: "Dopamine is a neurotransmitter in the brain whose responsibility is to mediate reward. It lets the organism know when things are good and when things are bad." It was DeNoble's experience with acetaldehyde that it condensed in the brain to form Dopamine-like compounds and made the animal somewhat "euphoric." (p. 66, lines 1-7; DeNoble Deposition in Rothgab)

c. Nicotine/Acetaldehyde, 1982 (CAVEAT: This research has never been published. There is nothing in the literature regarding the synergistic effects of nicotine and acetaldehyde. In addition, see description below re: Frank Ryan data on predicting sales.)

Upon learning that acetaldehyde functions as a positive reinforcer, they endeavored to study the combined effects of nicotine and acetaldehyde on self-administration. Results indicated that reinforcing effects of these agents are additive.

Research done by Frank Ryan indicated that acetaldehyde and nicotine data could be used to predict cigarette sales at a 96% accuracy. According to DeNoble, the hypothesis that they were working under at the time was based on the data from the animals. They hypothesized that they could predict the best selling cigarette by looking at the concentration not of nicotine alone, but by looking at the combination of nicotine and acetaldehyde.

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Frank Ryan ran a program and was able to predict blindly which cigarettes would sell and which wouldn't based on the combination of nicotine and acetaldehyde delivery. They were able to predict sales of 96 percent accuracy based upon the ratios of nicotine and acetaldehyde. They were further able to predict the best selling cigarettes as having the higher combination ratio of each one. (pp. 56-60; DeNoble Deposition in Rothgab) [1003582081/2082]

Note that DeNoble claims effect was synergistic. However, majority of documents all claim effect was additive. DeNoble indicated that they evaluated the effects of nicotine and acetaldehyde and found them to act synergistically together. They found that the combination of nicotine and acetaldehyde to be much more reinforcing than either one compound alone. (pp. 37-39; DeNoble Deposition in Rothgab)

DeNoble testified that Philip Morris could adjust the levels of nicotine and acetaldehyde in a given cigarette. However, to his knowledge this was not something that was done." (p. 72, lines 3-21; DeNoble Deposition in Rothgab)

d. Tolerance/Withdrawal Studies, 1979-1989

Tolerance to the effects of nicotine was shown to develop, probably due to behavioral adaptation. Note that tolerance in this context is not the same concept which appeared in, among other places, the 1964 and 1988 Surgeon General's Reports.

DeNoble found that nicotine does produce a tolerance, behavioral tolerance as well as a metabolic tolerance. He found that there is no behavioral super sensitivity following chronic administration of nicotine; that is, that the brain didn't up regulate the number of receptors. (pp. 37-39; DeNoble Deposition in Rothgab)

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Behavioral factors appear to be predominantly responsible for tolerance to nicotine. DeNoble indicated that there was a minor metabolic component to tolerance. "But predominantly in our animals the major contributing factor was a learned tolerance." (p. 137; DeNoble Deposition in Rothgab)

DeNoble concluded that termination of chronic nicotine administration did not produce a physical dependence. Termination did not result in withdrawal symptoms. Research showing that blocking nicotine central nervous system actions following chronic treatment does not result in a disruption of scheduled-controlled performance. This indicates that there is no withdrawal effects to nicotine. It also indicates that there is no physiological dependance to nicotine.

C. Connection With Addiction

DeNoble believed that "cigarette smoking didn't fit the criteria that was being set forth for addiction. Whether that criteria is accurate isn't the question. I don't believe that it is a correct statement to say that nicotine is addicting. I don't believe that; no." (p. 173, lines 21-25; p. 174, line 1; DeNoble Deposition in Rothgab)

DeNoble agrees that there is a difference between physiological dependance and psychological dependence. He believes there is a psychological dependance to cigarette smoking. "You can be psychologically dependant to many substances as well as many things. You can be psychologically dependant on running, for example. You can [be] psychologically dependent on saccharin, which doesn't produce a physical dependence, nor does cocaine. The degree to which cocaine produces a physiological dependance is extremely minor." DeNoble believes that a person can be addicted to cocaine even though there is no physiological dependance. (p. 176, lines 9-25; p. 177, lines 1-19; DeNoble Deposition in Rothgab)

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1. Nicotine

a. As a Positive Reinforcer

Although nicotine is self-administered, it does not produce disruptions in on-going behavior, nor does a physical dependence result.

DeNoble indicated that "many people equate physiological dependence with addiction. And that's not necessarily true. You don't, just because you are physiologically dependent doesn't mean you are addicted. Conversely, just because you are physiologically dependent doesn't mean that you are addicted either. So physical dependence is a pharmacological principle that is independent of addiction per se." (See pp. 132-134, 164, 170; DeNoble Deposition in Rothgab)

"We believe that primarily the disturbances that you see in a human are not based upon a physiological dependence but more one of a psychological dependence. (p. 170; DeNoble Deposition in Rothgab)

Many chemical compounds and physical stimuli including water, saccharin, food, heat, etc., can be self-administered and are therefore reinforcers. Addictive chemicals are self-administered, but because self-administration merely defines reinforcing qualities, there are other criteria which establish the definition of addiction. In DeNoble's opinion, addictive drugs produce disruptions in ongoing behavior when they are self-administered. Upon termination of drug access, there is a disruption in ongoing behavioral patterns. Addictive drugs are preferred to more conventional reinforcers, for example, food, water, heat, saccharin, etc. (pp. 100-101; DeNoble Deposition in Rothgab)

DeNoble indicated that removal of other positive reinforcers such as money, water,

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food, sex, can produce physiological disturbances. The behavioral changes that accompany the cessation of smoking are not different from that observed when other reinforcers such as food, water, sex, money, heat, light, sugar are withheld. (See pp. 105-107; DeNoble Deposition in Rothgab)

DeNoble agreed that 1) self-administration techniques establish reinforcing properties of a stimulus not its dependance producing capabilities; 2) animals will self-administer nicotine, however it does not appear to be a particularly powerful reinforcer compared to other drugs; 3) nicotine self-administration cannot be viewed as a form of drug abuse or as an addiction because there is strong evidence that nicotine does not fit the accepted criteria for drug dependance; 4) there's no evidence that smoking results in an overwhelming involvement with the use of smoke such that it interferes with normal social activities. (pp. 110-111; DeNoble Deposition in Rothgab; and also pp. 114-121 for similar statements by DeNoble)

b. Withdraval

Termination of nicotine access does not produce a withdraval syndrome.

c. Tolerance

DeNoble contended that tolerance can and often does develop to many stimuli (such as light, noise, temperature, etc.) Therefore, tolerance alone is not a defining characteristic of addiction (1003060667/0668 P)

According to DeNoble, development of a tolerance to nicotine is a two-component process: the major component involves the behavior adaptation of the organism, the minor component may involve traditional pharmacological mechanics. DeNoble believes that animals and people can become behaviorally adapted to many chemicals

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including saccharin and caffeine. (p. 165; DeNoble Deposition in Rothgab)

d. Conclusions

Nicotine is a reinforcer in a class of "nonaddictive" chemical compounds such as saccharin or water. [1003080621] (See pp. 101-104; specifically p. 103, lines 18-25 and p. 104, lines 1-3; DeNoble Deposition in Rothgab)

2. Acetaldehyde

Acetaldehyde was found to be a positive reinforcer without withdrawal effects.

3. Nicotine/acetaldehyde [CAVEAT: This research has never been published. There is nothing in the literature regarding the synergistic effects of nicotine and acetaldehyde. DeNoble believed that additional research on nicotine/acetaldehyde synergism may have shown that cigarettes were in fact addictive. See below for DeNoble deposition excerpts.]

DeNoble position regarding addiction: "I think that we have been discussing is the role of nicotine, and whether nicotine is addicting, and we have to realize that there are thousands of things in cigarette smoke. One of them is acetaldehyde. And I think when you combine nicotine and acetaldehyde you are talking about a very different combination. Talking about something that's probably much more dangerous than either one alone. So that has led me to believe that it's very possible that there are things that could lead to addiction; yes." (emphasis added) (p. 144, lines 20-25; p. 145, lines 1-7; DeNoble Deposition in Rothgab) I will go on record as saying a combination of nicotine and acetaldehyde, the reinforcing properties of that substance, that combination, are very, very powerful." (p. 145, lines 12-14, 17-22; DeNoble Deposition in Rothgab)

DeNoble: "I think by and large from the previous testimony they made nicotine in and of itself as

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probably not a very dangerous substance and acetaldehyde has a little more of a liability to it. But if you put the two together, you are talking about something that's synergistic and that was something that we have never experienced before and we never observed before. It was a rather unique and unprecedented finding. We never really got to the end of it. So I can't tell you what it means for addiction. But if you put the two together, it is clearly much more reinforcing than either one alone. And that makes me very suspicious that combination as well as other things could have potential for danger." (p. 159, lines 3-7, 22-25; p. 160, lines 1-10; DeNoble Deposition in Rothgab)

a. Results

Experiments conducted with acetaldehyde were very similar to those that were done with nicotine. As with nicotine, they found no withdrawal symptoms when using acetaldehyde. Termination of chronic exposure to combinations of nicotine and acetaldehyde did not result in a withdrawal symptom. He gave rats chronic administration of nicotine and acetaldehyde and never found physiological dependence. (pp. 135-136; DeNoble Deposition in Rothgab)

Research comparing the results of nicotine alone versus acetaldehyde alone versus several combinations of each. They found that if you combine nicotine and acetaldehyde, you can get self-administration rates, that is, the animal will work 500-600 percent more than either compound alone. (p. 154; DeNoble Deposition in Rothgab)

b. Conclusions

DeNoble stated that the following conclusions were reached regarding research on the effects of nicotine and acetaldehyde on the central nervous system: "Primarily that nicotine and acetaldehyde were probably acting through different biogenetic systems. They act on

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different brain systems but, nevertheless, they interacted. Nicotine primarily in the muscariaic (sp?) nicotinic side of the brain and acetaldehyde probably -- most probably through condensation reactions with a known neurotransmitter, Dopamine, in the brain." (p. 64, lines 18-25; p. 65, line 1; DeNoble Deposition in Rothman)

Nicotine and acetaldehyde function as positive reinforcers in rats. Combinations of nicotine and acetaldehyde are more reinforcing than either compound presented alone. The opiate reward system did not appear to mediate the reinforcing effects of nicotine or acetaldehyde. Since structurally acetaldehyde and nicotine have the potential to interact with the opiate system, they did preliminary work which involved blocking the opiate reward system with naloxone and it failed to have any effect. This initial result suggested that at least blocking one kind of opiate receptor, the new receptor, would not effect nicotine or acetaldehyde. They needed to do other work with other receptors to exclusively rule it out. Experimentation indicated that nicotine and acetaldehyde did not effect these opiate systems. Nicotine and acetaldehyde interacting alone were a reinforcer. Together they can act as a reinforcer. Specifically, they synergize to act as a reinforcer. Chronic studies using nicotine and acetaldehyde indicated that if you took it away there was no withdrawal. (pp. 166-168, 170-171 and 173; DeNoble Deposition in Rothman)

D. Why was Research Stopped

1. Sensitivity. (CAVEAT: Significance is self-evident.)

According to DeNoble, "we were the only tobacco company that I knew of, or that anybody else knew of, doing work with whole animals, live, whole animals, and because of the nature of the research, that is, looking at self-administration, looking at

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the effects of nicotine on the brain function, the research was held restricted to upper management use only." (p. 48, lines 17-23; DeNoble Deposition in Rothgab)

DeNoble discussed the effect of his research on the company with Dr. Charles, Dr. Osdene, Dr. Pages, Mr. McDow, Max Haussermann, Mr. Pollock and Jim Remington. "The potential was possibly making a safer, more rewarding cigarette. The downside was that we were doing whole animal research, which looked to them like we were doing Federal Drug Administration research." (p. 69, lines 2-25; p. 80, lines 1-2; DeNoble Deposition in Rothgab)

DeNoble understood that the research he was doing could undermine the public posture Philip Morris was taking with outsiders. (p. 149)

DeNoble discussed with Jim Charles and Tom Osdene the potential damage to the company of continuing animal research. He indicated this was also discussed with Dr. Abood, Dr. Wolf and with Mr. McDow. In fact a meeting was held with Abood, Wolf, DeNoble and McDow to discuss why they should continue the research and what impact it may or may not have on Philip Morris. (p. 80, lines 2-12; DeNoble Deposition in Rothgab)

DeNoble stated: "In discussions with management at Philip Morris, specifically Dr. Charles, Bob Pages and Dr. [Osdene], Max [Haussermann], the Vice President, we discussed the potential gains, that is, to understand cigarette smoking from a pharmacological point of view, the advantage of once we understood that to enhance the process, to make a better product. The downside of the whole aspect is we were doing whole animal research. We were the only ones in the field doing that. And we were discovering things that could be viewed as potentially dangerous from a biomedical point of view . . . we were developing nicotine's effects in a way in which the compound was viewed as a reinforcer, in the same way other substances are viewed as reinforcers, not only food and water and sex but also perhaps drugs. And we were using FDA

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approved methods at the time." (p. 80, lines 2-25; p. 81, lines 1-16)

2. Laboratory Shutdown (CAVEAT: Significance is self-evident.)

DeNoble, "We were offered an exit contract, termination, which consisted of a salary for several months and our job during that time of employment was to find another job. . . . Our lab was terminated on April 5th at 3 o'clock in the afternoon. We were called — I was called into Jim Charles' office. Present was Max [Hausermann], the Vice President of Research. They proceeded to tell me what a wonderful job the laboratory was doing, and then proceeded to say that we no longer did this research and that we had an option to leave the company, immediately with a cash settlement, to stay with the company at a severely reduced employment rate, as well as a reduction in grade, or we could opt to find another job while employed at Philip Morris, but our actual physical beings would be moved out of the research area into a private office." DeNoble stated that he was allowed back into the laboratory the following day on Friday, April 6 and was brought back another time in the preceding weeks to open up a safe in the lab. He was not permitted to go into the laboratory after those two occasions. He was not allowed to remove results of his tests, personal notebooks, data which he indicated would have supported the conclusions his research had reached. (p. 67, lines 10-25; p. 68, lines 1-25; DeNoble Deposition in Cipollone)

"The official line given to us was that our research efforts were no longer compatible with the goals of the Research Center. And for that reason our laboratory was terminated in one day." DeNoble indicates that up until the day of the termination no one had indicated to him that his research was not in the best interest of the company. (p. 70, lines 12-16; DeNoble Deposition in Rothgab)

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E. Publication Issues [HELPFUL]

DeNoble stated that he was allowed to publish some of his research projects. He indicated that he believed he had published two papers resulting from Philip Morris research. (p. 73, lines 11-17; DeNoble Deposition in Rothgab)

1. What DeNoble Has Published

DeNoble has published two full papers and five abstracts reporting on research he and his co-workers conducted at Philip Morris. One paper and its corresponding abstract of a meeting presentation were published while DeNoble was employed by Philip Morris. The rest were all published in 1986, after DeNoble left Philip Morris.. [See Appendix B for complete list and copies of publications.]

DeNoble indicated that he sought publication of an article he had previously published in abstract form in the 1983 Society for Neuroscience. However, Philip Morris had told him that this was proprietary and he could not publish this information. DeNoble did not abide by Philip Morris' instructions and published the research in full in Psychopharmacology in 1983 or 1984. After this was published, he received a call indicating that permission had not been granted and he should not do anything like that in the future. (pp. 81-84)

In 1986, DeNoble and Mele submitted an abstract to the Federation of Experimental Biologists. The abstract was submitted and published. When Philip Morris learned of this, they reminded him of the agreement which he had signed requiring him to keep his information confidential. DeNoble reported that he called Taussig and explained that the information he was publishing could in no way hurt Philip Morris because it was basic science research. However, DeNoble was told that any further breach of his contract would result in legal action against him. (pp. 85-86; DeNoble Deposition in Rothgab)

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American Psychological Association Convention in September of 1986. DeNoble reported that Frank Ryan was there to interview him and to take pictures of his presentation. Frank Ryan admitted to DeNoble that he was there at the request of Philip Morris to find out what DeNoble was doing. DeNoble was contacted by Taussig concerning the DeNoble and Mele presentations made at the American Psychological Association Convention. According to DeNoble, "I spoke with Mr. Taussig after this letter and assured him after discussing with him the potential damage that could occur or potential problems that could occur with divulging information and assured him that that would not happen in the future." (pp. 87-90; DeNoble Deposition in Rothgab)

3. Conclusions

None of DeNoble's publications contains any statement about nicotine dependence or addiction. The reported research certainly suggests, however, that the effects of nicotine on the behavior of rats are mediated in the central nervous system. In fact, in one publication DeNoble reports that specific brain sites have been located for the action of nicotine.

DeNoble also reports that his results show that rats may develop a behavioral tolerance to nicotine. On the other hand, Henningfield's apparent interpretation, in a 1984 review article, of one of DeNoble's abstracts, is that it shows that there is no withdrawal syndrome after cessation of nicotine administration.

3. So-called "Suppressed" Manuscripts

He stated specifically that he was not allowed to publish the research regarding the effects of nicotine and acetaldehyde. (p. 73, lines 19-23; DeNoble Deposition in Rothgab)

According to DeNoble, he has never revealed the findings of his research concerning the combined effect of nicotine and acetaldehyde in cigarettes. (pp. 90-91; DeNoble Deposition in Cipollone)

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a. "Positive Reinforcer"

A chronology of events concerning DeNoble's manuscript is given in Appendix C. In brief, the manuscript was approved by the Manuscript Review Board for publication in Science, although DeNoble had originally indicated he planned to publish it in Nature. The manuscript was also approved for publication by the Philip Morris Legal Department in January 1983, at which time DeNoble apparently submitted it for publication in Psychopharmacology. Subsequently, after a letter from Shook, Hardy to the Philip Morris Legal Department and discussions between Alex Holtzman and Jim Charles, DeNoble wrote to the editor of Psychopharmacology, Herbert Barry, withdrawing his manuscript due to factors beyond his control.

DeNoble, et al. (unpublished manuscript was submitted to Psychopharmacology) [See Appendix D] reported that rats could learn how to perform a simple task (pressing a lever) when they were rewarded by a small amount of injected nicotine. This suggests that nicotine might be mildly pleasurable to rats under certain laboratory conditions. These data do not imply that nicotine is addictive.

[VERY HELPFUL] The manuscript only provided preliminary data on a small number of rats. A total of only 10 rats were used; some data were based on only three rats.

The study was generally well-designed, but because of its small size, even if published would have been a minor contribution to the literature.

The results reported by DeNoble, et al. challenge the addiction hypothesis of nicotine.

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(a) The data indicate only weak reinforcement, which is not comparable to other pharmacologic drugs.

(b) The data did not provide any indication of physiological dependance on nicotine.

Several nicotine self-administration studies were appearing in the public literature at about the same time as DeNoble's research.

(a) DeNoble's manuscript does not report any action of nicotine not previously reported.

(b) The 1988 Surgeon General's Report considers the question of nicotine reinforcement to have been "showed conclusively" in 1981, based on government supported research.

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The DeNoble, et al. manuscript was not secret. Although unpublished, it was cited in 1984 by Jack Henningfield in a major review of the literature. Henningfield's review, in turn, was cited in the 1988 Surgeon General's Report.

b. "Mecamylamine" (Central Nervous System Nicotine Antagonist)

There was no manuscript with the title read by Kessler and Waxman, purportedly the 1986 manuscript that DeNoble withdrew from publication. There were research reports by DeNoble that discussed this research. [See Appendix E.] It appears that a abstract of part of this research was published in November 1986. DeNoble's withdrawal of this manuscript from publication apparently occurred after he had received a letter from Eric Taussig (Philip Morris Legal Department), sent after DeNoble had presented yet a different paper based on his research at

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Philip Morris. Mr. Taussig reminded DeNoble of the agreement he had signed with Philip Morris not to disclose any research without the company's permission. Mr. Taussig apparently did not specifically tell DeNoble he could not publish the mecamylamine paper, but DeNoble subsequently told him it would not be published.

Philip Morris has not seen the manuscript referred to by Dr. Kessler. It is apparently based on a small amount of preliminary data involving an attempt to demonstrate that if rats find nicotine mildly rewarding, it is because of some pleasurable effect of nicotine in the brain.

DeNoble's data on mecamylamine and reinforcement were only exploratory. While DeNoble was employed by Philip Morris, these data had never been written up for potential publication, much less submitted to the company for consideration for potential publication.

To the extent that any research by DeNoble on mecamylamine had been prepared for publication, it was, in fact, published. There are two reports on mecamylamine based on Philip Morris research, both of which make claims similar to the manuscript referred to by Dr. Kessler, at least insofar as both claim central nervous system effects of nicotine.

Use of nicotine blockers, such as mecamylamine, to evaluate reported central nervous system effects of nicotine, has been reported for decades, certainly as early as 1973 in humans. Numerous studies beginning in the late 1970s and early 1980s involving animals are reported in the literature, and these are reviewed by the 1988 Surgeon General's Report.

Mecamylamine is a highly imperfect substance as a tool to identify central nervous system effects of nicotine. It has a wide variety of

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physiological effects. These effects include blocking peripheral sensations from nicotine, which may be important to its actions as a reward.

In general, whether any reinforcing capacity of nicotine in a laboratory rat can be blocked by mecamylamine does not bear strongly on the addiction issue.

F. Admission [CAVEAT: Significance is self-evident]

DeNoble was asked if any executive of Philip Morris expressed to him whether or not smoking was addicting. According to DeNoble, Jim Remington told DeNoble and Dr. Mele that cigarette smoking was probably addicting. "Mr. Remington visited our laboratory with Dr. Jim Charles, myself, and Paul Mele to discuss the concept of addiction and what we were doing with our rats. And in the conversation we were relating to Mr. Remington that nicotine in and of itself we didn't believe produced a physical dependence. It was a weak reinforcer. At that point we were both surprised to hear Mr. Remington say that as far as he knew that was not true, and he was -- as far as he knew, nicotine was addicting, and cigarette smoke was addicting." (pp. 144, 171-172; DeNoble deposition in Rothgab)

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APPENDIX A

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PUBLICATIONS OF RESEARCH ON SMOKING BEHAVIOR CONDUCTED OR SPONSORED BY PHILIP MORRIS

Conducted by Philip Morris

1. Dunn, WL, "Experimental Methods and Conceptual Models as Applied to the Study of Motivation in Cigarette Smoking," In: Smoking Behavior: Motives and Incentives, 93-111 (1973).

2. Schori, TR; Jones, BW, "Smoking and Multiple-Task Performance," Virginia Journal of Science, 25(3): 147-151 (1974).

3. Ryan, FJ, "Cold Turkey in Greenfield, Iowa: A Follow-Up Study," In: Smoking Behavior: Motives and Incentives, 231-241 (1975).

4. Schori, TR; Jones, BW, "Smoking and Work Load," Journal of Motor Behavior, 7(2): 113-120 (1975).

5. Schori, TR; Jones, BW, "The Effect of Smoking on Risk-Taking in a Simulated Passing Task," Human Factors, 19(1): 37-45 (1977).

6. Dunn, WL, "Smoking: What Reinforces the Habit?" Karger Gazette, 36: 1-2 (1978).

7. Dunn, WL, "Smoking as a Possible Inhibitor of Arousal," Int Workshop Behav Effects of Nicotine, 18-25 (1978).

Sponsored by Philip Morris

1. Emley, GS; Hunter, NA; Hutchinson, RR, "Selective Actions of Morphine, Chlorpromazine, Chlordiazepoxide, Nicotine, and D-Amphetamine on Shock-Produced Aggressive and Other Motor Responses in the Squirrel Monkey," Federation Proceedings, 30: 390 (1971).

2. Hutchinson, RR; Emley, GS, "Effects of Nicotine on Avoidance, Conditioned Suppression and Aggression Response Measures in Animals and Man," In: Smoking Behavior: Motives and Incentives, 171-196 (1973).

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3. Meyer, AS; Friedman, LN; Lazarsfeld, PF, "Motivational Conflicts Engendered by the On-Going Discussion of Cigarette Smoking," In: Smoking Behavior: Motives and Incentives, 243-254 (1973).

4. Lazarsfeld, PF, "The Social Sciences and the Smoking Problem," In: Smoking Behavior: Motives and Incentives, 283-286 (1973).

5. Kozlowski, LT; Harford, MR, "On the Significance of Never Using a Drug: An Example from Cigarette Smoking," J. Abnormal Psychology, 85(4): 433-434 (1976).

6. Kozlowski, LT, "Effects of Caffeine Consumption on Nicotine Consumption," Psychopharmacology, 47: 165-168 (1976).

7. Beratsen, GG; Beattie, MS; Walker, JM, "Effects of Nicotine and Muscarinic Compounds on Biting Attack in the Cat," Pharmacology, Biochemistry, and Behavior, 5: 235-239 (1976).

8. Berntson, GG; Sahley, T, "Some Effects of Nicotine on Pain Sensitivity in the Rat," Bulletin of the Psychoneurological Society, 12: 246 (1977).

9. Hutchinson, RR; Pierce, CE; Emley, GS; Proni, TJ; Sauer, RA, "The Laboratory Measurement of Human Anger," Biobehavioral Reviews, 1(4): 241-259 (1977).

10. Schachter, S; Silverstein, B; Kozlowski, LT; Perlick, D; Herman, CP; Liebling, B, "Studies of the Interaction of Psychological and Pharmacological Determinants of Smoking," Journal of Experimental Psychology: General, 104(1): 3-4 (1977).

11. Schachter, S, "Nicotine Regulation in Heavy and Light Smokers," Journal of Experimental Psychology: General, 104(1): 5-12 (1977).

12. Schachter, S; Kozlowski, LT; Silverstein, B, "Effects of Urinary pH on Cigarette Smoking," Journal of Experimental Psychology: General, 104(1): 13-19 (1977).

13. Silverstein, B; Kozlowski, LT; Schachter, S, "Social Life, Cigarette Smoking, and Urinary pH," Journal of Experimental Psychology: General, 104(1): 20-23 (1977).

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14. Schachter, S; Silverstein, B; Kozlowski, LT; Herman, PC; Liebling, B, "Effects of Stress on Cigarette Smoking and Urinary pH," Journal of Experimental Psychology: General, 104(1): 24-30 (1977).

15. Schachter, S; Silverstein, B; Perlick, D, "Psychological and Pharmacological Explanations of Smoking Under Stress," Journal of Experimental Psychology: General, 104(1): 31-40 (1977).

16. Kozlowski, LT; Kleiman, RM, "Effects of Oral pH on Cigarette Smoking," Pharmacology Biochemistry & Behavior, 9(4): 477-480 (1978).

17. Sahley, TL; Berntson, GG, "Antinociceptive Effects of Central and Systemic Administrations of Nicotine in the Rat," Psychopharmacology, 65: 279-283 (1979).

18. Waldbillig, RJ, "Suppressive Effects of Intraperitoneal and Intraventricular Injections of Nicotine on Muricide and Shock-Induced Attack on Conspecifics," Pharmacology, Biochemistry, and Behavior, 12: 619-632 (1980).

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PUBLICATIONS OF RESEARCH ON SMOKING BEHAVIOR CONDUCTED OR SPONSORED BY PHILIP MORRIS

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3. Meyer, AS; Friedman, LN; Lazarsfeld, PF, "Motivational Conflicts Engendered by the On-Going Discussion of Cigarette Smoking," In: Smoking Behavior: Motives and Incentives, 243-254 (1973).

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14. Schachter, S; Silverstein, B; Kozlowski, LT; Herman, PC; Liebling, B, "Effects of Stress on Cigarette Smoking and Urinary pH," Journal of Experimental Psychology: General, 104(1): 24-30 (1977).

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18. Waldbillig, RJ, "Suppressive Effects of Intraperitoneal and Intraventricular Injections of Nicotine on Muricide and Shock-Induced Attack on Conspecifics," Pharmacology, Biochemistry, and Behavior, 12: 619-632 (1980).

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PUBLICATIONS BY VICTOR J. DeNOBLE
BASED ON RESEARCH PERFORMED AT PHILIP MORRIS

1. "Behavioral Effects of Intraventricularly Administered (-)-Nicotine on Fixed Ratio Schedules of Food Presentation in Rats." (V. DeNoble, Y. Dragan and L. Carron)

   * 1981 Presentation of part of this research at meeting of the Society for Neuroscience, November 1981.

   * 1981 Abstract published (note different title): "Studies on the Effects of Intraventricular Infusions of (-)-Nicotine on Behavior Maintained Under Fixed Ratio Schedules," Society for Neuroscience Abstracts 7 (1981).

   * 1982 Full paper published: Psychopharmacology 77:317-323 (1982).

   * Affiliation: Philip Morris Research Center

   * Experiment with mecamylamine suggests that the behavioral effects of nicotine in rats are mediated by central nervous system (CNS) receptors.

   * At least five previously published studies of the effects of nicotine on the behavior of rats were cited.

   * This research replicated in part and extended previous published research by Abood.

2. "Antagonism of Chronic Nicotine Administration: Effects on Schedule-Controlled Behavior in Rats." (V. DeNoble, F. Ryan, Y. Dragan, P. Mele, J. Naworal and R. Kornfeld)

   * 1982 Presentation at meeting of the Society for Neuroscience, 1982.

   * 1982 Abstract published: Society for Neuroscience Abstracts 8:395 (1982). [copy of abstract not available]

   * 1984 Abstract cited by Jack Henningfield in a published review article: "Behavioral Pharmacology of Cigarette Smoking," Advances in Behavioral Pharmacology 4:131-210 (1984).

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- Henningfield cited DeNoble's abstract as an example of research that supported the following conclusion: "Finally, in animal studies in which high levels of tobacco smoke or nicotine intake are maintained for extended periods, abrupt abstinance is not followed by the onset of a withdrawal syndrome." [emphasis added]

- Henningfield's comment is helpful in itself; it is also significant in that Henningfield was aware in 1984 that Philip Morris was conducting research on nicotine in animals. (In this review article, Henningfield also cited DeNoble's 1983 unpublished manuscript released to the press by Waxman. This is addressed in other resources.)

3. "Brain Sites Involved in the Mediation of the Behavioral Effects of Intraventricularly Administered (-)-Nicotine." (V. DeNoble and P. Mele)

- 1986 Presentation at meeting of the American Psychological Association, August 23-26, 1986.

- 1986 Abstract published: Pharmacol. Biochem. Behav. 25:1367 (1986).

- 1986 Full paper published: Psychopharmacology 90:156-162 (1986).

- Affiliation: Department of Psychology, Virginia Commonwealth University, but unquestionably based on research conducted at Philip Morris.

- This report extended DeNoble's previous report on nicotine's effect on rat behavior to a second strain of rats.

- This research identified specific brain sites at which nicotine acts.

- There is no indication in the publication that the results show nicotine dependance or addiction.

4. "Chronic Mecamylamine Does Not Produce Behavioral Supersensitivity to Nicotine." (P. Mele and V. DeNoble)

- 1986 Presentation at meeting of the Society for Neuroscience, November 9-14, 1986.

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* 1986 Abstract published: Society for Neuroscience Abstracts 12:309 (1986).

* Affiliation: Department of Psychology, Virginia Commonwealth University, but unquestionably based on research conducted at Philip Morris.

* The reported research implicitly indicates that nicotine acts on the central nervous system.

* There is no statement concerning the implications of the research for nicotine dependence or addiction.

5. "Development of Behavioral Tolerance Following Chronic Nicotine Administration." (P. Mele and V. DeNoble)

* 1986 Presentation at meeting of the Federation of American Societies for Experimental Biology, April 13-18, 1986.

* 1986 Abstract published: Fed. Proc. 45:431 (1986).

* Affiliation: Department of Psychology, Virginia Commonwealth University, but unquestionably based on research conducted at Philip Morris.

* DeNoble concluded that his results "demonstrate that tolerance develops to the behaviorally disrupting effects of [nicotine]."

* He also concluded that behavioral factors can enhance the degree of tolerance developed.

* There is no indication that the results showed a physiological tolerance to nicotine.

* There is no statement in the abstract relating these results to nicotine dependence or addiction.

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CONFIDENTIAL

Ross R. Millhiser October 7, 1969

Joseph F. Cullman 3rd

I have reviewed carefully the proposal contained in Dr. Wakeham's memorandum to Clifford Goldsmith dated October 26, 1969, relative to a biological research program. I have discussed with you and George Weissman informally my serious reservations about the wisdom of embarking upon this program at this time.

I would like to keep this matter under active consideration with a review at least quarterly by Senior Management of Philip Morris Incorporated and Philip Morris - U.S.A.

I would be particularly interested in ascertaining specifically what other tobacco companies are doing in this field as well as what the Government is actually doing as contrasted to what they are talking about doing.

I still favor having the Council for Tobacco Research - U.S.A. approach this problem as it has in the past.

The legal, philosophical, and practical problems of mounting a PM biological research program seem to me to outweigh the advantages.

Joseph F. Cullman 3rd

cc: G. Weissman
C. Goldsmith
H. Wakeham
P. D. Smith

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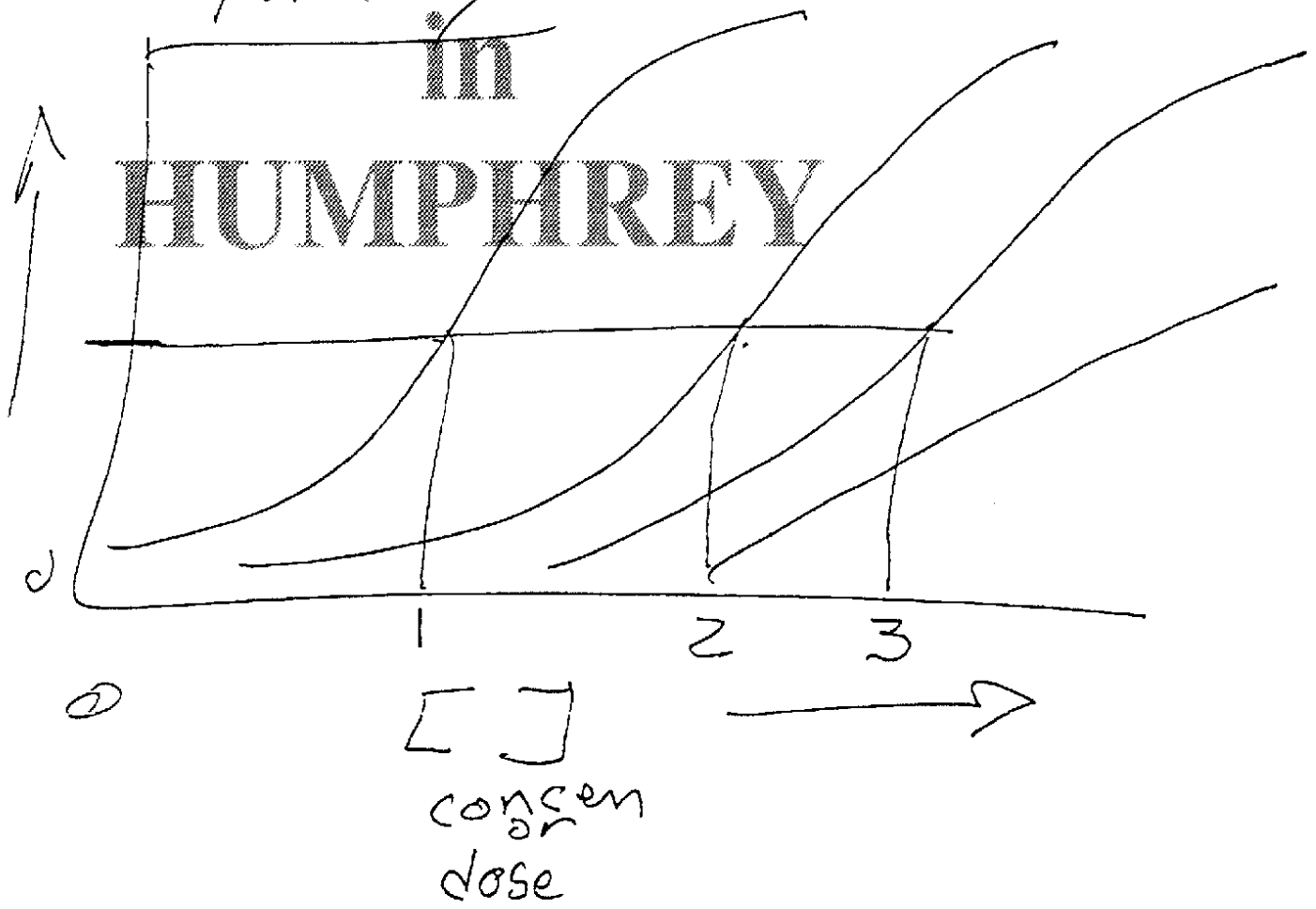

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